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#### EDUCATION

Ph.D. Geochemistry, June 1985, California Institute of Technology, Pasadena, CA

Thesis Title: *Differential Weathering Effects and Mechanisms*.

Advisors: Robert P. Sharp, Barclay Kamb and George R. Rossman.

Recipient of the *Antarctic Service Medal of the United States* for scientific exploration.

M.S. Geochemistry, June 1981, California Institute of Technology, Pasadena, CA

Thesis Title: *Sputtering of Dirty-Ice by Protons on Ganymede as a Formation Mechanism for Dark-Ray Craters*. Advisor: Gene Shoemaker. Recipient of the *ARCS Foundation Award*.

B.S. Geology/Biology, Magna Cum Laude, June 1979, Brown University, Providence, RI

Research Topic: *Further Experiments in the Chemical Origin of Life with Specific Geologic Boundary Conditions*. Advisor: Hendrick Gerritsen. Recipient of the *Department of Geology Research Award* and the *Mathematics Association of America Award*.

#### EXPERIENCE

##### **NMSU Carlsbad Environmental Monitoring and Research Center (CEMRC) 2004-present**

###### Director

Carlsbad, NM

Chief Executive Officer of the Center and Chief Scientist, responsible for management of scientific/technical programs, facilities, operation and budget, obtaining funding, conflict resolution and supervision of NMSU staff together with WTS, LANL and LES NEF staff. Fostering collaborative and interdisciplinary work among four independent entities under one roof and under one radioactive materials license, for investigating and monitoring the WIPP underground nuclear repository with various other research and development programs associated with nuclear energy and nuclear waste disposal. Liaison with federal, state and local government agencies, state and federal congressional delegations, industry and the public on energy distributions and strategies, radiation safety and nuclear issues state-wide, and regulatory, health and safety issues in the region. Active research in the areas of energy policy, nuclear energy and radioactive waste disposal, dirty bomb mitigation, acid mine drainage, military base clean-up, and contaminant flow and transport in arid regions. Coordinator for Science and Public Outreach.

- ◆ *Recipient of the President's Millionaire Researchers Award*
- ◆ *Member American Council On Renewable Energy Higher Education Committee*
- ◆ *Member of the American Society of Mining and Reclamation*
- ◆ *Board Member to the New Mexico State MESA Public School Program*
- ◆ *Member ASTM Committee E54 Homeland Security Applications*
- ◆ *Recipient of the American Nuclear Society Logistics Award 2006*
- ◆ *Member DHS LLIS Radiological Dispersal Device Incident Response Planning Working Group*
- ◆ *Member AAPG EMD Uranium Committee*
- ◆ Professional Geoscientist in the State of Texas (License #3545)
- ◆ Voting Member, Board of Directors, Carlsbad Department of Development

##### **Los Alamos National Laboratory (LANL) 1999-present**

Los Alamos and Carlsbad, NM

###### Affiliate Scientist

2004 to present

###### Team Leader, Repository Science

October 2000 to 2004

###### Section Leader, Radionuclide Geochemistry

March 1999 to October 2000

- ◆ Project Leader for Actinide Chemistry and Repository Science
- ◆ Supervised the efforts of 41 diverse scientific and technical staff.
  - Managed, coordinated and co-authored the *Unsaturated Zone Transport Analysis and Modeling Report (AMR)* for contribution to the Site Selection and License Application for Yucca Mountain as the geologic repository for high level nuclear waste.

- ◆ PI on RDD research for developing alternative matrices to <sup>137</sup>CsCl for reducing dispersibility
- ◆ PI on the DoD Environmental Security Technology Certification Program (ESTCP) Project for Remediation of Small Arms Firing Ranges.
- ◆ Recipient of a ASTM *Standards Development Award*
- ◆ Recipient of U.S. Patent 6,217,775 for Phosphate-Induced Metal Stabilization
- ◆ The Carlsbad Schools *Distinguished Performance Award* for restoration of a local Planetarium
- ◆ Appointed as Adjunct Professor in Chemistry at New Mexico State University, Las Cruces

**UFA Ventures, Inc. 1994-1999**

Richland, WA

CEO and Chief Scientist

October 1994 to March 1999

- ◆ Entrepreneur and small business owner: Designed, funded, built and headed an innovative soils and materials testing laboratory, UFA Ventures, Inc., having unique capabilities including –
  - Developed the Unsaturated Flow Apparatus (UFA™: ASTM Standard Test Method D6527) as the first hydrogeochemical apparatus that allows direct measurement of transport parameters (K, D,  $K_a$ ,  $\psi$ ,  $K$ ,  $\theta$ , G) in any porous media.
  - Lead scientist in a Cooperative Research And Development Agreement (CRADA) with Beckman Instruments to design and market the UFA.
  - Hired/trained staff to implement projects from bench to field, including expert data for litigation.
- ◆ Recipient of the U.S. DOE's *Innovative Concepts Award*.

**Washington State University at Tri-Cities 1990-1996** Research Faculty in Env. Sci. Richland, WA

- ◆ Obtained funding to establish, build and equip the *Earth and Environmental Sciences Laboratory*, for the investigation of subsurface transport and remediation technologies.
- ◆ Developed curriculum for the new Masters degree program in Environmental Science
  - Graduated the first Ph.D. student from the new campus
  - Developed and taught fourteen courses over a six-year period.
- ◆ President of the Pacific Northwest Region of the American Geophysical Union
- ◆ Recipient of DOE's *Technology Transfer Award*, and a DOE Richland Operations *Manager's Award*

**Pacific Northwest National Laboratory 1987-1990** Geochemist

Richland, WA

**NASA Jet Propulsion Laboratory 1985-1986** Radar Geologist/Field Mapping

*split* Pasadena, CA

**Arizona State University, Department of Geology 1985-1987** Geochemist

*position* Tempe, AZ

**Exxon Production Research, Reservoir Evaluation 1982** Geochemist

Houston, TX

**Total Research Grants and Contracts:** \$42.8 million in grants/contracts from FY1990 to FY2010

LECTURE SERIES

*The GeoPolitics of Energy – achieving a just and sustainable energy distribution by 2040*

*Geology – the global science*

*Dirty Bombs – the terror and the truth*

*Science and Society – the cost of the Apollo Effect*

*Planetary Science – the emergence of global thinking*

*Antarctica – ice and rock with life*

PEER-REVIEWED ARTICLES, BOOKS, MAGAZINES, PAPERS AND REPORTS

Conca, J. and T. Kirchner (2010) "Environmental Monitoring of a Deep Geologic Repository: Experience at WIPP", Chapter 24 in *Geological Repositories for Safe Disposal of Spent Nuclear Fuels and Radioactive Materials*, J. Ahn and M. J. Apted (editors), Woodhead Publishing, Cambridge, UK (in press).

Thakur, P., J. L. Conca, L. J. Van de Burgt and G. R. Choppin (2009) "Complexation and the Laser Luminescence Study of Eu(III), Am(III) and Cm(III) with EDTA, CDTA and PDTA and their Ternary Complexation with Dicarboxylates," *Journal of Coordination Chemistry* (in press).

Conca, J. L. (2009) Developing Safe and Sustainable Energy, *International Innovation Magazine*, J. Dallison (editor), August edition, United Kingdom, ISSN 2041-4552, p. 19 - 21.

Parra, R. R., V. F. Medina, and J. L. Conca (2009) "The use of fixatives for response to a radiation

- dispersal device attack – a review of the current state-of-the-art”, *Journal of Environmental Radioactivity*, vol. 100, p. 923 - 934.
- Conca, J. and J. Wright (2009) A Single Global Nuclear Repository. *Proceedings of the 2009 Waste Management Symposia*, Phoenix, AZ, paper #9085, p. 1-9.  
[http://www.wmsym.org/index.php?option=com\\_content&view=article&id=138&Itemid=112](http://www.wmsym.org/index.php?option=com_content&view=article&id=138&Itemid=112).
- Wright, J. and J. L. Conca (2009) The GeoPolitics of Energy: Engaging the Public and Policymakers. *Proceedings of the 2009 Waste Management Symposia*, Phoenix, AZ paper #9557, p. 1-10.  
[http://www.wmsym.org/index.php?option=com\\_content&view=article&id=138&Itemid=112](http://www.wmsym.org/index.php?option=com_content&view=article&id=138&Itemid=112).
- Conca, J. L. and J. Wright (2008) “Nuclear Energy and Radioactive Waste Disposal”, in *International Seminars on Nuclear War and Planetary Emergencies, 38<sup>th</sup> Session*, The Science and Culture Series – Nuclear Strategy and Peace Technology, R. Ragaini, editor, World Scientific - Imperial College Press, ISBN 978-981-283-463-8, p. 271-280.
- Conca, J., S. Sage and J. Wright (2008) “Nuclear Energy and Waste Disposal in the Age of Recycling,” *New Mexico Journal of Science*, vol. 45, p. 13-21 <http://www.nmas.org/NMJoS-Volume-45.pdf>
- Wright, J. and J. Conca (2007) *The Geopolitics of Energy: Achieving a Just and Sustainable Energy Distribution by 2040*, Booksurge Publishing, Charleston, SC. ISBN 1-4196-7588-5.  
<http://www.amazon.com/gp/product/1419675885/sr=1-10/qid=1195953013/>
- Conca, J. L. and M. Apted (2007) Nuclear Energy and Radioactive Waste Disposal in the Age of Recycling, In *GLOBAL '07 - Advanced Nuclear Fuel Cycles and Systems*, American Nuclear Soc, p. 1-8.
- Martin, W.A., S. L. Larson, D.R. Felt, J. Wright, C.S. Griggs, M. Thompson, J.L. Conca, and C. Nestler (2007) “The effect of organics on lead sorption onto Apatite II,” *Applied Geochemistry*, vol. 23, p. 34-43.
- Campbell, M., H. Wise, J. Evensen, B. Handley, S. Testa, J. Conca and H. Moore (2007) Nuclear Power: Winds of Change, Uranium Committee Annual Report, Amer. Assoc. of Petroleum Geologists Energy Minerals Division, Tulsa, OK, [www.mdcampbell.com/EMDUraniumCommitteeReport031907Rev.doc](http://www.mdcampbell.com/EMDUraniumCommitteeReport031907Rev.doc)
- Conca, J. L. and J. Wright (2006) “An Apatite II permeable reactive barrier to remediate groundwater containing Zn, Pb and Cd,” *Applied Geochemistry*, vol. 21, p. 1288-1300.
- Conca, J. L. and M. H. Reynolds (2006) “Dirty Bombs, practical plans,” *Homeland Protection Professional*, May 2006 issue, p. 18-22.
- Conca, J. (2006) “A 12-Point Response to a Dirty Bomb Attack,” *Transactions of the American Nuclear Society*, La Grange, IL, vol. 95.
- Mie, D., J. L. Conca, C. den Auwer, R. I. Gabitov, N. J. Hess, P. Paviet-Hartmann, P. D. Palmer, V. LoPresti and S. D. Conradson (2006) “Chemical speciation of heterogeneously reduced Pu in synthetic brines,” *Radiochimica Acta*, vol. 94, p. 249-259.
- Martinez, M.N., S.S. Hightower, G.B. Smith, W. Mueller, J.L. Conca and J. Wright (2006) “The effect of Apatite II™ on the biodegradation of TNT and perchlorate in contaminated soil samples.” In *Sustainable Range Management*, Battelle Press, Columbus, OH. [www.battelle.org/bookstore](http://www.battelle.org/bookstore).
- Adams, B., N. Yancey, J. Conca and J. Wright (2006) “PRB Containing Processed Fish Bones Sequesters Metals from Ground Water”, *Technology News and Trends*, Environmental Protection Agency EPA 542-N-06-002, Issue 23, p. 5-7.
- Raicevic, S., J. V. Wright, V. Veljkovic and J. L. Conca (2006) “Theoretical stability assessment of uranyl phosphates and apatites: Selection of amendments for in situ remediation of uranium,” *Science of the Total Environment*, vol. 355, p. 13-24.
- Conca, J. (2006) “Addressing the Threat of a Serious <sup>137</sup>Cs Dirty Bomb”, *Proc. 14<sup>th</sup> Biennial Topical Meeting of the Radiation Protection and Shielding Division April 2-6*, American Nuclear Society, La Grange, IL, p. 284-287.
- Conca, J. L., M. Johnson, and J. R. Wischnewsky (2005) “Reducing the Threat of a Serious <sup>137</sup>Cs Dirty Bomb,” in the *Proceedings of the DHS Conference: Working Together: Research & Development (R&D) Partnerships in Homeland Security*, Boston, MA, April 27–28, the Department of Homeland Security, Science and Technology Directorate, Section 4, p. 1-10.
- Wright, J., J. L. Conca, and A. F. Slater (2005). PIMS with Apatite II: A field scale demonstration on a lead contaminated soil, Chapter 4 in *Stabilisation/Solidification Treatment and Remediation*, A. Al-Tabbaa and J. A. Stegemann, (eds), Taylor and Francis Group, London, ISBN 04 1537 460 X.
- Wright, Judith and James L. Conca (2005) “PIMS™: Remediation of Soil and Groundwater Contaminated With Metals.” Environmental Security Technology Certification Program (ESTCP) Cost and Performance Report, (CU-0020), <http://www.estcp.org/technology/er-heavy-metals.cfm>, 50 pp.
- Wright, J., Rice, K. R., B. Murphy, and J. Conca (2004) “PIMS Using Apatite II™: How It Works To Remediate Soil and Water,” in *Sustainable Range Management-2004. Proceedings of the Conference*

- on Sustainable Range Management, January 5-8, 2004, New Orleans, [www.battelle.org/bookstore](http://www.battelle.org/bookstore), ISBN 1-57477-144-2, B4-05.
- Raicevic, S., J. V. Wright, J. Vujic and J. L. Conca (2004) "Prediction of the Weathering Properties of Minerals Based on the Ion-Ion Interaction Potential," *Materials Res. Soc. Symp. Proc.*, v.824, p.455-460.
- Wright, J., Rice, K. R., B. Murphy, and J. Conca (2004). "PIMS-Remediation of Pb-Contaminated Soil at Camp Stanley, Texas," in *Sustainable Range Management-2004. Proceedings of the Conference on Sustainable Range Management, January 5-8, 2004, New Orleans*, [www.battelle.org/bookstore](http://www.battelle.org/bookstore), ISBN 1-57477-144-2, B4-04.
- Conca, J., E. Strietelmeier, N. Lu, S. D. Ware, T. P. Taylor, J. Kaszuba, and J. V. Wright (2003) "Treatability Study of Reactive Materials to Remediate Groundwater Contaminated with Radionuclides, Metals and Nitrates in a Four-Component Permeable Reactive Barrier," Chapter 8, in *Groundwater Remediation of Metals, Radionuclides, and Nutrients, with Permeable Reactive Barriers* (eds. Naftz, Morrison, Davis, and Fuller), Elsevier Science, USA, p. 221-252.
- Lu, N., Reimus, P., Parker, G., Conca, J., and Triay, I. R. (2003) "Sorption Kinetics and Impact of Temperature, Ionic Strength and Colloid Concentration on the Adsorption of Plutonium-239 by Inorganic Colloids," *Radiochimica Acta*, vol. 91, p. 713-720.
- Wright, J. and J. Conca (2003) "Remediation of groundwater contaminated with Zn, Pb, and Cd using Apatite II." *Acta Mineralogica-Petrographica, Abstract Series 1*, Szeged, Hungary. [http://www.mineral.hermuz.hu/act\\_03/pdf/114.pdf](http://www.mineral.hermuz.hu/act_03/pdf/114.pdf)
- Wright, J. and J. L. Conca (2003) "PIMS With Apatite II™ for the Remediation of Uranium and Plutonium." *Proceedings of the Radiochemistry Conference*, July 14-17, 2003, Carlsbad, NM.
- Lu, N., J. L. Conca, T. Hartmann, P. Paviet-Hartmann, G. Parker, B. Martinez, and E. Strietelmeier (2003) "Solution Chemistry and Plutonium-239 Behavior in Synthetic Brines and Chloride Solutions after Exposure to Magnesium Oxide Backfill", Los Alamos National Laboratory Technical Report LA-UR-02-3665, Los Alamos, NM.
- Mason, C., J. L. Conca and G. V. Tuyle (2003) *An Alternative Matrix for reducing the Threat of Radioactive Dispersal from <sup>137</sup>Cs Sources*, Los Alamos National Laboratory Technical Report LA-UR-03-0048, Los Alamos, NM.
- Taylor, T. P., N. N. Sauer, J. L. Conca, B. A. Strietelmeier, J. P. Kaszuba, M. W. Jones & S. D. Ware (2002) "Permeable Reactive Barrier Treatment Technology for Remediation of Inorganic-Contaminated Groundwater," in *Remediation of Chlorinated and Recalcitrant Compounds*, A.R. Gavaskar and A. S. C. Chen (Editors), Battelle Press, Battelle Memorial Institute, Columbus, Ohio, vol. 2, 2A-05(1-8).
- Wright, J. and J. Conca (2002) "Remediation of Groundwater and Soil Contaminated with Metals and Radionuclides using Apatite II, a Biogenic Apatite Mineral," in *Proceedings of the American Chemical Society Meeting, Boston, MA*, American Chemical Soc., Vol. 42, No. 2.
- Lu, N., P. Paviet-Hartmann, P. Palmer, T. Hartmann, J. L. Conca, E. Strietelmeier, and G. Parker (2002) *Stability of <sup>239</sup>Pu(VI) in Synthetic Brines, Chloride Solutions and Hydrochloric Acid*, Los Alamos National Laboratory Technical Report LA-UR-02-4165, Los Alamos, NM.
- Conca, J. L. and J. Wright (2001) Biogenic Apatite: From In Vivo to In Vitro Incorporation of Metals and Radionuclides Into Apatite Mineral Phases. In *Proceedings of the Second Hydroxyapatite Congress*, Schwind and Subramanian (eds.), Bio-Rad Labs, Berkeley, CA.
- Lu, N., H. Xu, J. Wright, and J. Conca (2001) "PIMS - Remediation of Metal-Contaminated Groundwater and Soil Using a Special Reactive Form of the Mineral Apatite," In *Applied Mineralogy in Research, Economy, Technology, Ecology and Culture*, Rammilmair, J. Mederer, Th. Oberthür, R.B. Heimann, and H. Pentinghaus (eds.), A.A.Balkema, Rotterdam (Publ.), ISBN 90 5809 163 5, Vol. 2, p. 603-606.
- Conca, J. L. and J. V. Wright (2001) ASTM Standard Test Method D6527 "Determining Unsaturated and Saturated Hydraulic Conductivity in Porous Media by Steady-State Centrifugation," Annual Book of ASTM Standards: Soil and Rock (II), Section 4, Volume 04.09, p. 868-877, American Society for Testing and Materials, West Conshohocken, PA.
- Conca, J. L. (2001) *Transport in Porous and Fractured Media of the Creede Formation*, United States Geological Survey Open File Report 94-260-N, USGS, Reston, Virginia, p. 1-16.
- Strietelmeier, B.A., M.L. Espinosa, M.W. Jones, J.D. Adams, E.M. Hodge, S.D. Ware, P.A. Leonard, P. Longmire, J.P. Kaszuba and J.L. Conca (2001) REMEDIATION OF NITRATE-CONTAMINATED GROUNDWATER USING A BIOBARRIER, in *Proceedings of the 2001 Waste Management Conference*, February 2001, Tucson, AZ.
- Conca, J. L., A. Meijer, P. Reimus and J. Turin (2000) *Analysis and Modeling Report U0100: Unsaturated Zone and Saturated Zone Transport Properties*, ANL-NBS-HS-000019 REV 00, ICN 1. Office of Civilian

- Radioactive Waste Management, System Management and Operations, Department of Energy, Las Vegas, NV. 293 p.
- Conca, J., Lu, N., Strietelmeier, E., Ware, S. D., Garcia, Jr., E., Jones, M., Espinosa, M., Martinez, B., Adams, J., Sauer, N. N., Taylor, T. P., Kaszuba, J., Triay, I., Longmire, P., Heller, P., and Wright, J. V. (2000) "Remediation of Metal-Contaminated Groundwater Using Permeable Reactive Barriers – Assembling a Reactive Media Toolbox," in *Proceedings from the 2000 Theis Conference*, September 15-18, Jackson Hole, The National Ground Water Association (NGWA) and The Assoc. of Ground Water Scientists & Engineers (AGWSE), Westerville, OH.
- Conca, J. L., N. Lu, G. Parker, B. Moore, A. Adams, J. V. Wright and P. Heller (2000) "PIMS – Remediation of Metal Contaminated Waters and Soils", in *Remediation of Chlorinated and Recalcitrant Compounds*, (Wickramanayake, Gavaskar, Gibbs and Means, eds.) Battelle Memorial Institute, Columbus, Ohio, vol. 7, p. 319-326.
- Conca, J. L. and J. Wright (2000) "The UFA Method for Characterization of Vadose Zone Behavior," Chapter 3 In *The Vadose Zone*, (Looney and Falta, eds.) Battelle Press, Battelle Memorial Institute, Columbus OH, p. 1459 and Appendix 3.
- Conca, J., D. G. Levitt, P. R. Heller, T. J. Mockler, and M. J. Sully (2000) "Recharge and Infiltration Distribution at the Nevada Test Site and the Hanford Site," Chapter 5 In *The Vadose Zone*, (Looney and Falta, eds.) Battelle Press, Battelle Mem. Inst., Columbus OH, p. 1459 and App 5.
- Conca, J. L. (2000) "Batch Kd Tests versus Column Rf tests," Chapter 6 In *The Vadose Zone*, (Looney and Falta, eds.) Battelle Press, Battelle Mem. Inst., Columbus OH, p. 1459 and App 6.
- Conca, J. L. and J. Wright (2000) "Aqueous Diffusion in the Vadose Zone," Chapter 5 In *The Vadose Zone*, (Looney and Falta, eds.) Battelle Press, Battelle Mem. Inst., Columbus, OH, p. 796-797.
- Conca, J. and J. V. Wright (2000) "PIMS: A Simple Technology for Clean-Up of Heavy metals and Radionuclides Throughout the World," In: *Environmental Challenges of Nuclear Disarmament*, T. E. Baca and T. Florkowski, eds., Kluwer Acad. Publ., NATO Science Series, vol. 29, p. 223-236.
- Lu, N., J. L. Conca, G. Parker, P. Leonard, B. Moore, E. Strietelmeier and I. Triay (2000) "Adsorption of actinides onto colloids as a function of time, temperature, ionic strength, and colloid concentration", LANL Technical Report LA-UR-00-5121, Los Alamos, NM.
- Conca, J. L. and J. V. Wright (2000) United States Patent #6217775 TREATMENT OF METAL-CONTAMINATED LEACHATES UTILIZING FISH BONES AND FISH HARD PARTS, (filed 1998, issued 2000) United States Patent Office, Washington, D.C.
- Wright, J. V. and J. L. Conca (2000) STABILIZATION AND REMEDIATION OF METAL-CONTAMINATED SOILS USING FISH BONES, (filed 2000) United States Patent Office, Washington, D.C.
- Bostick, W. D., R. J. Jarabek, D. A. Bostick, and J. Conca (2000) "Phosphate-Induced Metal Stabilization: Use of Apatite and Bone Char for the Removal of Soluble Radionuclides in Authentic and Simulated DOE Groundwaters," *Advances in Envir. Res.*, vol. 3, p. 488-498.
- Mason N. Lu, and J. L. Conca (1999) "Radioactive Strontium- and Cesium-Contaminated Sites: Characterization, Transport, and Remedial Options," in *Proceedings of the Advanced Research Workshop: Nuclear Physical Methods in Radiological Investigations of Nuclear Test Sites*, Almaty, Kazakhstan, June 7-10, 1999.
- Nelson, P. and J. L. Conca, (2001) *Present-Day Porosity and Permeability in Lacustrine Strata and Fallout Tuffs*, United States Geological Survey Open File Report OFR 94-260, USGS, Reston, VA.
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- Mason, C.F.V., N. Lu, and J. Conca (1999) *Characterization, Transport and remediation Options for Radioactive Strontium and Cesium Contaminated Sites*, Los Alamos National Laboratory Technical Report LA-UR-99-3593, Los Alamos, NM.
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- Conca, J. L. (1998) *Success Mine Apatite Remediation Project Using Apatite*. Report to the Idaho State Department of Environmental Quality #QC038900.
- Zhou, W., J. L. Conca, J. L. and J. Kessler (1998) "Numerical Simulation of Percolation Box Experiments on the Performance of a Richards Barrier," *Proceedings of the Tenth International High-Level Radioactive Waste Management Conference*, American Nuclear Society, La Grange Park, Illinois, vol. 9, p. 474-476.

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