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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, handling administrative planning, day-to-day operations, and supervision of 25 NMSU staff, 7 WTS staff and 7 LANL staff. Liaison with federal, state and local government agencies, state and federal congressional delegations, industry and the public on energy distributions and strategies, as well as regulatory, health and safety issues in the region. Responsible for overall management of scientific/technical programs, facilities, operation and budget, expansion of facilities and scientific capabilities, and working with University Administration, State and Federal representatives to address radiation safety and nuclear issues state-wide. Active research in the areas of dirty bomb mitigation, nuclear energy and radioactive waste disposal, acid mine drainage remediation, military base clean-up, and contaminant flow and transport in arid regions.

- ♦ *Member ASTM Committee E54 Homeland Security Applications*
- ♦ *Recipient of the President's Millionaire Researchers Award*
- ♦ *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)

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

- ♦ Project Leader for Actinide Chemistry
  - Principal Investigator (PI) for actinide chemistry, testing of the scientific basis for site and performance assessment through direct experiments with U and Pu in brines as a function of oxidation state, geology, backfill chemistry and waste constituents.
  - PI on the Pu-MgO Backfill Project: determination of repository backfill characteristics and performance of MgO under repository conditions, particularly changes in aqueous chemistry and effects on Pu and U concentrations in solution.
- ♦ PI on RDD research for developing alternative matrices to ^{137}CsCl for reducing dispersibility
- ♦ PI on the DoD Environmental Security Technology Certification Program (ESTCP) Project for Remediation of Small Arms Firing Ranges.
- ♦ PI for Science and Public Outreach.
- ♦ Developed, staffed, and managed the technical, programmatic and budget efforts of a culturally and technically diverse scientific staff at LANL, New Mexico State University and the Institute of Nuclear Chemistry and Technology (Warsaw, Poland).

- Funded and executed laboratory refurbishment at the Carlsbad Environmental Monitoring and Research Center (CEMRC) facility for performing actinide chemistry experimental work up to milliCurie activity levels.
- Installation of a Nd-YAG Class 4 Laser, a Bruker X-Ray Diffractometer, a complete UFA system, and a Cary 500 Spectrophotometer.
- Provided data to DOE to ensure compliance with the criteria for recertification of the Waste Isolation Pilot Plant (WIPP) promulgated in 40 Code of Federal Regulations (CFR) 194 and the U.S. Environmental Protection Agencies (EPA) Radiation Protection Standards promulgated in 40 CFR 191.
- Responsible for the review, oversight, management, and budget for the D&D of the Source Term Test Program (STTP) Program at LANL that produced large amounts of transuranic and hazardous waste.
- Continued response to scientific questions and issues from state and federal regulators, watch-dog groups, the scientific community, and the public, that arise as WIPP becomes fully operational.

♦ Recipient of the ASTM *Standards Development Award*
♦ 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

Section Leader, Radionuclide Geochemistry — March 1999 to October 2000

♦ 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 of Yucca Mountain as the geologic repository for high level nuclear waste.
- Oversaw the interdivisional transfer of the section between C-Division and E-Division, while retaining full funding and laboratory capabilities.

♦ Team Lead on Yucca Mountain Project for radionuclide transport
- Principal Investigator (PI) on the Colloid Project, determination of the adsorption of actinides onto inorganic colloids as a function of temperature, ionic strength and colloid concentration.
- Laboratory and field testing of technologies for disposal of radioactive waste and remediation of metal and radionuclide contamination in soils and groundwater.

♦ PI on the Uranium Remediation Project for remediation of uranium-contaminated firing ranges
♦ Recipient of the Los Alamos Laboratory *Distinguished Performance Award* for work on the Yucca Mountain Project

UFA Ventures, Inc. 1994-1999 — Richland, WA
President and Chief Scientist — October 1994 to March 1999

♦ Entrepreneur and small business owner: formed and headed an innovative soils and materials testing laboratory, UFA Ventures, Inc., having unique capabilities including –
- The Unsaturated Flow Apparatus (UFA™): designed, developed and commercialized by Conca (ASTM Standard Test Method D6527) as the first hydrogeochemical apparatus that allows direct measurement of any fluid transport parameter (K, D, k_a, ψ, K, θ, G) in any porous media by simultaneously controlling the fluid flow and fluid driving force.
- Phosphate-Induced Metal Stabilization (PIMS, U.S. Patent 6,217,775): remediation technology for metal and radionuclide contaminated soil, groundwater, and wastewater.
- Took these technologies from concept to full commercialization, and then marketed the technologies to a diverse group of clients from government and industry.
- Hired and trained staff to implement projects from bench to pilot to field scale.
- Clients included the Department of Defense, Department of Energy, U.S. Environmental Protection Agency, Idaho Department of Environmental Quality, American Geotech, Applied Environmental Services, Bechtel, Electric Power Research Institute, HydroGeoChem, INTERA Sciences, Japanese Power Reactor and Nuclear Fuel Corp., Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Pacific Northwest Laboratory, Soils Inc., TerraGraphics Inc., TRW, U.S. Geological Survey, and Westinghouse.

♦ Designed, funded, built and equipped a soil physics and subsurface chemical transport laboratory for the design and testing of characterization and remediation technologies.
♦ Provided technical support for repository site characterization programs –

- Expert data for litigation
- RI scopes of work, RI/FS, and RD/RA for environmental restoration programs and other RCRA and CERCLA activities.
- Provided technical expertise to federal, state and private company representatives.
- Evaluated performance assessment of asphaltic membranes, compacted bentonite, and chemically reactive media.
- Aqueous chemical effects of infiltration into backfill materials, and static leaching tests of liner materials.

♦ Recipient of the U.S. DOE's *Innovative Concepts Award*

Washington State University at Tri-Cities 1990-1996 Richland, WA
Associate Professor of Research January 1990-96 (Adjunct 1996 to present)

♦ Faculty member in Environmental Science –
- Investigating unsaturated and saturated flow in geologic materials, the resulting water-rock interactions under surface and near-surface conditions, and the impact of microhydrologic environments on aqueous chemistry and contaminant transport.
- Developed the *Universal Diffusion Curve* for molecular species in aqueous environments.
- Provided technical support for repository site characterization programs.

♦ Obtained funding to establish, build and equip the *Earth and Environmental Sciences Laboratory*, devoted to the investigation of unsaturated phenomenon, subsurface transport and the development of characterization 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.

♦ Program Manager and Principal Investigator for several DOE, USGS, Japanese PNC, and DoD programs.

♦ President of the Pacific Northwest Region of the American Geophysical Union

♦ Chaired numerous symposia, workshops and review boards

♦ Recipient of the U.S. DOE's *Technology Transfer Award*, and a DOE Richland Operations *Manager's Award*

Pacific Northwest National Laboratory 1987-1990 Richland, WA
Geochemist August 1987 to January 1990

- Research scientist/Project Manager/Task Leader investigating hydrogeological phenomenon in the vadose zone.
- Design and construction of a hydrogeochemical laboratory.
- Task Leader and Cognizant Manager for the Gravel Barrier Technology Project and SubTask Leader for the Vapor Diffusion Task under the Grout Disposal Program.
- Task Leader for Directed Percolation Around Waste Packages using Engineered and Natural Barriers. Task Leader for Rubble Backfill Transport Properties Project for Yucca Mountain.
- Developed curricula for DOE's *Science in Schools* initiative.

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: >$39 million in grants/contracts from 1990 to 2008

PEER-REVIEWED ARTICLES, BOOKS, PAPERS AND REPORTS

Conca, J., S. Sage and J. Wright (2008) "Nuclear Energy and Waste Disposal in the Age of Recycling," *Journal of the New Mexico Academy of Sciences* (in press).

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.

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, Uranum Committee Annual Report, Amer. Assoc. of Petroleum Geologists Energy Minerals Division, Tulsa, OK, 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," *Radiochemica 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.

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 137Cs Dirty Bomb", *Proc. 14th 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 ^{137}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./, 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, 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.,* vol. 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, 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

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 ^{137}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 239Pu(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,* Rammlmair, 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.

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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.

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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 REMEDIATIN 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.

Conca, J. L., M. Apted, W. Zhou, R. Arthur, and J. Kessler (1998) "Flow Barrier System for Long Term High-Level Waste Isolation: Experimental Results," *Nuclear Technology*, vol.124, p.1-13.

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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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