

# Ayodeji B. Alajo; Assistant Professor, Nuclear Engineering

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## EDUCATION:

- Doctor of Philosophy**, Nuclear Engineering, 2010  
Texas A&M University, College Station, TX  
*Dissertation: "Fission Product Impact Reduction via Protracted In-Core Retention in Very High Temperature Reactor (VHTR) Transmutation Scenarios"*
- Master of Science**, Nuclear Engineering, 2007  
Texas A&M University, College Station, TX  
*Thesis: "Impact of PWR Spent Fuel Variations on TRU-Fueled VHTRs"*
- Bachelor of Science**, Mechanical Engineering, 2001  
University of Ibadan, Nigeria

## PROFESSIONAL EXPERIENCE:

- Assistant Professor**; Nuclear Engineering Jan 2011 to Date  
Missouri S&T, Rolla, MO
- Postdoctoral Research Associate**; Texas Engineering Experiment Station Jun 2010 – Jan 2011  
Texas A&M University, College Station, TX
- Graduate Student Intern** Jun 2008 – Aug 2008  
Idaho National Laboratory, Idaho Falls, ID
- Graduate Assistant, Research**; Advisor: Pavel V Tsvetkov Jun 2005 – May 2010  
Department of Nuclear Engineering, Texas A&M University, College Station, TX

## PROFESSIONAL INTERESTS:

- Nuclear Reactor Physics and Thermal Hydraulics
- High Fidelity Nuclear Systems Design and Modeling
- Coupled Neutronics-Thermal Hydraulic (Multi-physics) Analysis
- Complex Modeling of Nuclear Systems
- Evolutionary and Advanced Energy Systems (LWRs, HTGRs, Fast Reactors and ADS)
- Advanced Fuel Cycles
- Safety of Nuclear Systems and Nuclear Energy Technologies

## PROFESSIONAL AFFILIATIONS

- Institute of Nuclear Materials Management, 2005
- American Nuclear Society, 2007
- Alpha Nu Sigma Nuclear Engineering Honor Society, 2009.
- Phi Kappa Phi National Honor Society, 2010.

**REFEREED JOURNAL PAPERS:**

1. **A. B. Alajo**, P.V. Tsvetkov, "Impact of PWR Spent Fuel Variations on Back-End Features of Advanced Fuel Cycles with TRU-fueled VHTRs", *Annals of Nuclear Energy*, **38** (2011), pp. 88-97 (2010).
2. P. V. Tsvetkov, T. G. Lewis III, **A. B. Alajo**, D. E. Ames II, "'Used Fuel' Vectors and Waste Minimization Strategies for VHTRs Operating without Refueling", *Nucl. Eng. Des.*, **240** (2010) 2458-2465 (2010).
3. P. V. Tsvetkov, T. G. Lewis III, **A. B. Alajo**, D. E. Ames II, "VHTR-Based Systems for Autonomous Co-Generation Applications", *Nucl. Eng. Des.*, **240** (2010) 2451-2457 (2010).
4. P. V. Tsvetkov, **A. B. Alajo**, D. E. Ames II, "Autonomous Control Strategies for VHTR-based Systems for Hydrogen Production," *J. of Eng. for Gas Turbine and Power – Transactions of the ASME*, Vol 131, Article # 052906 (2009).
5. P. V. Tsvetkov, T. G. Lewis III, **A. B. Alajo**, "TRU-Fueled VHTRs for Applications Requiring an Extended Operation with Minimized Control and No Refueling," *J. of Eng. for Gas Turbine and Power – Transactions of the ASME*, Vol 131, Article # 052907 (2009).
6. P. V. Tsvetkov, D. E. Ames II, **A. B. Alajo**, T. G. Lewis III, "Spectrum Shifting as a Mechanism to Improve Performance of VHTRs with Advanced Actinide Fuels", *Nucl. Eng. Des.*, **238** (2008), pp. 1958-1964 (2008).

**REFEREED CONFERENCE PAPERS:**

7. S. E. Bays, **A. B. Alajo**, "On the Criticality Safety of Transuranic Sodium Fast Reactor Fuel Transport Casks", Proc. ANS Topical Meeting/Intern. Conf. on Reactor Physics (PHYSOR 2010), Pittsburgh, Pennsylvania, May 9 – 14, 2008, paper 44-1, ANS (2010).
8. **A. B. Alajo**, P. V. Tsvetkov, "Utilization of Transuranics as Fuel Component in VHTR Systems: The Back-end Considerations," Intern. Conf. on Advanced Nuclear Fuel Cycles and Systems (GLOBAL 2009), September 6-11, 2009, Paris, France, paper 9471 (2009).
9. **A. B. Alajo**, P. V. Tsvetkov, "Core Lifetime and Fuel Utilization in Prismatic VHTR Cores", Proc. ANS Topical Meeting/Intern. Conf. on Reactor Physics (PHYSOR 2008), Interlaken, Switzerland, September 14 – 19, 2008, paper 569, pp 1 - 6, Paul Scherrer Institute, ISBN 978-3-9521409-5-6, PSI (2008).
10. P. V. Tsvetkov, D. E. Ames II, **A. B. Alajo**, M. L. Pritchard, "Self-Sustainability of VHTR Configurations with Advanced Actinide Fuels", Proc. ANS Topical Meeting/Intern. Conf. on Reactor Physics (PHYSOR 2006), Vancouver, Canada, September 10 – 14, 2006, paper D071, ANS, ISBN: 0-89448-697-7 (2006).
11. P. V. Tsvetkov, D. E. Ames II, M. L. Pritchard, **A. B. Alajo**, T. G. Lewis III, "TRU-fueled VHTRs: Design, Performance and Applications", Proc. ANS Topical Meeting/Intern. Conf. on Advanced Nuclear Fuel Cycles and Systems (GLOBAL 2007), September 9-13, 2007, Boise, Idaho, USA, pp 852 – 855, ANS, Omnipress, ISBN: 0-89448-055-3 (2007).
12. P. V. Tsvetkov, **A. B. Alajo**, T. G. Lewis III, D. E. Ames II, "Out-of-Core Fuel Cycle Characteristics of VHTRs with No On-Site Refueling", Proc. Intern. Congr. Adv. Nucl. Power Plants (ICAPP 08), Anaheim, California, June 8 – 12, 2008, ANS Embedded Topical Meeting, 2008 ANS Annual Meeting, paper 8233, pp. 298 - 302, ANS (2008).

13. P. V. Tsvetkov, D. E. Ames, M. L. Pritchard, **A. B. Alajo**, "Spectrum Shifting as a Mechanism to Improve Performance of VHTRs with Advanced Actinide Fuels", Proc. 14th Intern. Conf. on Nucl. Eng. (ICONE 14), July 17 – 20, 2006, Miami, Florida, USA, paper ICONE14-89563, pp. 929 – 934, ASME, ISBN: 0-7918-4242-8 (2006).
14. P. V. Tsvetkov, T. G. Lewis III, **A. B. Alajo**, "TRU-Fueled VHTRs for Applications Requiring an Extended Operation with Minimized Control and No Refueling", Proc. 16th Intern. Conf. on Nucl. Eng. (ICONE 16), Orlando, Florida, May 11–15, 2008, paper ICONE16-48334, pp. 331 – 338, ISBN: 0-7918-4817-5 ASME (2008).
15. P. V. Tsvetkov, D. E. Ames II, **A. B. Alajo**, T. G. Lewis III, "VHTR-Based Systems for Autonomous Co-Generation Applications", Proc. 4th Intern. Conf. on HTR Technology (HTR2008), Sept. 28 – Oct. 1, 2008, Washington D.C., USA, paper HTR2008-58228, pp. 745 – 753, ASME, ISBN: 978-0-7918-4854-8 (2008).
16. P. V. Tsvetkov, **A. B. Alajo**, D. E. Ames II, "Autonomous Control Strategies for VHTR-based Systems for Hydrogen Production", Proc. 4th Intern. Conf. on HTR Technology (HTR2008), Sept. 28 – Oct. 1, 2008, Washington D.C., USA, paper HTR2008-58231, pp. 553 – 559, ASME, ISBN: 978-0-7918-4854-8 (2008).
17. P. V. Tsvetkov, T. G. Lewis III, **A. B. Alajo**, D. E. Ames II, "Used Fuel" Vectors and Waste Minimization Strategies for VHTRs Operating without Refueling", Proc. 4th Intern. Conf. on HTR Technology (HTR2008), Sept. 28 – Oct. 1, 2008, Washington D.C., USA, paper HTR2008-58233, pp. 659 – 668, ASME, ISBN: 978-0-7918-4855-5 (2008).

#### **REFEREED CONFERENCE SUMMARIES:**

18. **A. B. Alajo**, P. V. Tsvetkov, "Reactor Physics of VHTRs with UO<sub>2</sub>, UCO & UC0.5O1.5 Kernels Operating without Onsite Refueling", Trans. Amer. Nucl. Soc., 98, pp. 736 – 737, USA (2008).
19. P. V. Tsvetkov, T. G. Lewis III, **A. B. Alajo**, "Utilization of TRUs in VHTRs – Operation in a Single-Batch Mode: Front End, Back End, and Performance", Trans. Amer. Nucl. Soc., 98, pp. 733 – 735, USA (2008).
20. M. L. Pritchard, P. V. Tsvetkov, **A. B. Alajo**, "Neutronics Analysis of Pebble-Bed Cores with TRUs", Trans. Amer. Nucl. Soc., 96, pp. 827 – 828, USA (2007).
21. P. V. Tsvetkov, **A. B. Alajo**, "Potential of Minor Actinides to Enhance VHTR Performance Characteristics", Trans. Amer. Nucl. Soc., 94, pp. 93 – 94, USA (2006).
22. P. V. Tsvetkov, D. E. Ames II, **A. B. Alajo**, "Configuration Adjustment Potential of the VHTR Prismatic Cores with Advanced Actinide Fuels", Trans. Amer. Nucl. Soc., 94, pp. 597 – 598, USA (2006).
23. P. V. Tsvetkov, M. L. Pritchard, D. E. Ames II, **A. B. Alajo**, "Analysis of the Pebble-Bed VHTR Spectrum Shifting Capabilities for Advanced Fuel Cycles", Trans. Amer. Nucl. Soc., 94, pp. 403 – 404, USA (2006).