

DR MARGARET MSONGI MKHOSI-MOTSAATHEBE

Mobile:

Email:

EDUCATION

- **PhD in Nuclear Engineering (2007)**, Nuclear Engineering Program, The Ohio State University, Columbus, OH
- **M.S. in Nuclear Engineering (2003)**, Nuclear Engineering Program, The Ohio State University, Columbus, OH
- **MSc Physics (2000)**, Faculty of Agriculture, Science and Technology, University of North-West, Mafikeng
- **B.S. Honors in Physics (1995)**, School of Education, University of Bophuthatswana, Mafikeng, South Africa
- **B.S. (Education) (1993)**, School of Education, University of Bophuthatswana, Mafikeng, South Africa

FURTHER TRAINING

- **Finance for Non-Financial Managers (2013)**: Gordon Institution of Business Studies, South Africa
- **Management Accelerated Program (2012)**: INSEAD Business School of the World, Fontainebleau, France
- **Program in Project Management (2009)**, Continuing Education at University of Pretoria, South Africa
- **Advanced Risk Assessment (2009)**, Bureau for International Risk Assessment
- **Nuclear Project Management (2009)**, Northwest University/ARECSA, South Africa
- **Fundamentals of Probabilistic Safety Assessment (2008)**, Post Graduate School of Nuclear Science & Engineering, NWU
- **High Temperature Reactor Technology (2008)**, Post Graduate School of Nuclear Science & Engineering, North-West University

EMPLOYMENT HISTORY

- **Current: Director– Bonetetshi Pty Ltd**
 - Part-time Lecturer, North-West University Centre for Applied Radiation Science & Technology
 - Develop Nuclear Science & Technology Education materials for Secondary school teachers and learners
 - Work with Department of Education to develop curriculum for schools
 - Training & Research
 - STEM Education development
- **2021 – 2024: Chief Executive Officer – National Radioactive Waste Disposal Institute**
 - Strategically manage and coordinate the activities of the Institute and be responsible for its day-to-day business. The role has the authority to carry out these responsibilities in accordance with the direction and policies established by the Board, while ensuring that the Institute performs its functions effectively and in line with the provisions of the NRWDI Act.
- **2017 – 2021: Director - Centre for Nuclear Safety & Security(CNSS), National Nuclear Regulator**
 - Overall management, Co-ordination and operations of the CNSS
 - Facilitate development of leading-edge Research & Development Programme, including collaborative and interdisciplinary research, in areas related to Nuclear Safety and Security
 - Develop networks between the research Centre and researchers in the public and private sectors, locally, nationally and internationally
 - Establish strong linkages with appropriate institutions and units and adding value to NNR for Research and Development programmes
 - Manage the research plan effectively and efficiently, ensuring that accepted standards of research and ethical behaviour are met
 - Spearhead the sourcing of funds for research conducted by CNSS, for capital and operating funds
 - Develop, implement and manage delivery of Education & Training Programme in Nuclear Safety & Security
 - Facilitate the development of training materials and in-house courses for the NNR

- Capacitate the Centre to provide Regulatory Technical Support Services to the NNR
- **2015 – 2017: Senior Manager-Liquid Effluent Management Services, Necsa**
 - Provide strategic leadership and management of Liquid Effluent Management Services (LEMS) Department within the Operations Division, through partnerships with the effluent generators and other facilities on the Necsa site.
 - Ensure the efficient treatment of radiological effluent is carried out in accordance with relevant national and international statutory and legislative requirements, ensuring commitment to health, safety and security of the workers and complete care of the public and environment.
- **2011 – 2015: General Manager-Special Projects, Technology Innovation Agency**
 - **Established & Managed Youth Technology Innovation Fund:** The fund is aimed at promoting and stimulating the culture of technology innovation and entrepreneurship amongst the young people, in various sectors including Energy, ICT, Water, Food & Agriculture. The fund is targeted at youth between ages of 18 and 30. It is driven to deliver on developing pipeline of innovative technologies for various economic sectors.
 - **Manage High Impact Projects:** The objective of the High Impact portfolio is to give optimal resources to targeted investment opportunities to deliver on upon the TIA objectives within 3 years or less. These investment opportunities are targeted to demonstrate to stakeholders the ability of TIA to deliver on technology innovation. The outcome of these opportunities must be new products/services launched onto the market that are delivering immediate and recognizable socio-economic impact, and in particular delivering into South Africa's national imperatives.
- **2010 – 2011: Nuclear Engineer – Accident Analysis and PSA 2, National Nuclear Regulator, Centurion**
 - Develop and establish an effective Accident Analysis Unit for the National Nuclear Regulator
 - Perform technical safety assessments and analysis of nuclear installations and other nuclear activities regulated
 - Performed severe accident research on Thermal Power Uprate and the Steam Generator Replacement Projects for Koeberg Nuclear Power Plant, making use of MELCOR code.
 - Review the safety cases to ensure that radiological effect during the normal and accident conditions is within acceptable limits
 - Review acceptability of the safety case and suitability of licensing submittals
 - Review of Safety Analysis Report for the new research reactor at NECSA
 - Perform independent safety analyses for nuclear installations via safety analysis submissions
 - Evaluate safety analysis methodologies used by licensees and recommend improvements thereof
 - Evaluate adequacy of the applicable International Safety Standards and Guidelines
- **2008 – 2010: Nuclear Engineer- Thermal-Hydraulics, National Nuclear Regulator, Centurion**
 - Assess nuclear and thermal-hydraulic aspects of nuclear reactor-, plant systems- and nuclear facility under design and beyond design conditions
 - Conduct Accident analysis research associated with the PBMR confinement building using
- **2007 – March 2008: Senior Analyst – Nuclear Engineering Analysis, PBMR Pty Ltd**
 - Computational analysis of fission product and dust transport in the PBMR confinement building using ASTEC code.
- **June 2007 – June 2008: Post Doctoral Research Associate, School of Nuclear Engineering, Purdue University, USA**
 - Analyzing the effect of void fraction and bounce on the deposition of aerosol particles in a random packed bed

of pebbles in a pebble bed modular reactor;

- **2001 – 2007: Research Associate, Nuclear Engineering Program, The Ohio State University, USA**
 - Use CFD code FLUENT to analyse fluid flow and aerosol particle deposition in a pebble bed modular reactor under normal and low flow operating conditions.
- **1996 – 2000: Physics Lecturer, Department of Physics, University of North-West, South Africa**
 - Teaching Physics to undergraduate students
 - Supervising Undergraduate Laboratory Practical Work
- **1995: Lecturer, Lehurutshe College of Education**
 - Training Secondary Teachers in Physical Sciences
- **1993 – 1994: High School Science Teacher: North-West Department of Education, South Africa**
 - Letsatsing High School: Taught Mathematics and Physical Science
 - Barolong High School: Taught Biology

RESEARCH EXPERIENCE

- **Postdoctoral researcher (June 2007 to June 2008), School of Nuclear Engineering, Purdue University**

Analyzing the effect of void fraction and bounce on the deposition of aerosol particles in a random packed bed of pebbles in a pebble bed modular reactor;
- **Research Associate: Ohio State University (4 years)**

Use CFD code FLUENT to analyse fluid flow and aerosol particle deposition in a pebble bed modular reactor under normal and low flow operating conditions.
- **Research Associate: University of Northwest (2 years)**

Perform experimental work on the degradation of the cold and hot legs of the Ringhals Steam Generator of the Koeberg nuclear power plant that has been in operation for 15 years. Some experience with X-ray Diffraction (XRD) technique, transmission electron microscopy (TEM), scanning electron microscopy (SEM)

RESEARCH SUPERVISION/MENTORSHIP

- **International Research Mentor for European Leadership for Safety Education at Université Côte d'Azur in Nice, France**
 - 2024 to 2025: Assessment of Safety Culture and Leadership for Safety at a Radioactive Waste Disposal Institute
 - 2022 to 2023:
 - The impact of organizational dynamics on safety in radioactive waste disposal facilities
 - Knowledge Management Program designed to enhance safety leadership among operators.
- **Research Co-Supervisor, at Centre for Applied Radiation Science & Technology (CARST), North West University, Mafikeng Campus**
 - 2024 Honours Project: Applying Liquid Scintillation Analysis to resolve nuclear forensic signatures in radioactive waste
 - 2025 Masters: Topic to be finalised

COMPUTER SKILLS/QUALIFICATIONS

- Computational Fluid Dynamics code FLUENT Advanced Training, 2003, FLUENT Inc. Ann Arbor, Michigan
- Language and Software: MATLAB, Word, Excel, PowerPoint, Microsoft Project
- Operating system: UNIX, Windows.

FELLOWSHIPS

- USAID/Tertiary Education Linkage Program (TELP) Fellow (2001 –2003)
- National Research Foundation (NRF), South Africa (2003-2005)

▪ LEADERSHIP

- **Founder & Board Member:** An Inspired Scientist (Current)
- **Founder & Chair:** Women & Youth Support Organisation (Current)
- **International Representative on Board:** Zambia STEM Foundation (Current)
- **Executive Board Member:** Women in Nuclear Global (2014-2020)
- **Executive:** Women in Nuclear-Africa Region: Since 2015
- **Independent Board Member:** National Radioactive Waste Disposal Institute (NRWDI) – (2013 -2014)
- **Board Member:** Women in Nuclear Global (WiN-Global) – (2011-2015)
- **President:** Women in Nuclear South Africa since (2011 -2015)
- **Chairperson:** Outreach & Education Committee of American Nuclear Society Student Chapter, Ohio State University (2005,2006)
- **Chairperson:** 2005 American Nuclear Society Student Conference (2005)
- **President:** American Nuclear Society Student Section of Ohio State University (2002,2003)

AWARDS

- The Ohio State University - Distinguished Alumni Award for Career Achievement (2020)
- The Ohio State University – in recognition of outstanding contribution to nuclear safety & security while successfully overcoming significant challenges, Ada Irene Pressman Award (2019)
- American Nuclear Society Young Professionals Thermal Hydraulics Division Award, (2007)
- Nuclear Engineering Achievement Award for Exemplary Service (2006, 2004, 2002)
- Outstanding Graduate Student Award at The Ohio State University, 44th Leadership Awards (2005)
- Outstanding Graduate Student Award at The Ohio State University, 45th Leadership Awards (2006)
- Nuclear Engineering Achievement Award for Leadership (2005, 2003)
- Leadership Award for 2005 ANS Conference Chair (2005)

PUBLICATIONS

- M. Mkhosi, R. Denning and A. Fentiman. “**Fluid Flow Analysis in Pebble Bed Modular Reactor Using RANS Turbulence Models**”, accepted for ICONE16, Orlando, Florida, May 11-15,2008
- M.M. Mkhosi and R.S. Denning, “**Aerosol Particle Deposition in Pebble Beds Under Low Flow Conditions**”, ANS/ENS International Meeting and Nuclear Technology Expo, Washington DC, November11-152007.
- M.M. Mkhosi and R.S. Denning, “**Aerosol Particle Deposition in Pebble Beds in High Reynolds Number Regime**”, ANS/ENS International Meeting and Nuclear Technology Expo, Washington DC, November11-15 2007.
- M M Mkhosi, “**Computational Fluid Dynamics Analysis of Aerosol Deposition in Pebble Beds**”, PhD Dissertation, The Ohio State University, 2007.
- M. Mkhosi, R. Denning and S. Nakamura, “**The Application of Advanced Computational Methods to the Modeling of PBMR Source Term**”, ICONE12, Arlington, VA, April 25-29,2004.
- R. Denning, M. Mkhosi, S. Nakamura, R. Christensen and V. Kogan, “**Aerosol Transport in PBMR Accidents**”, Pittsburgh, ICAPP’04, Pittsburg, PA, June 13-17,2004.
- M M Mkhosi, “**Inertial Deposition of Aerosols in Pebble Beds**”, MS Thesis, The Ohio State University, 2003.