Summary CV of Dr Peter Baricholo

Dr Peter Baricholo was born on 27 September 1969 in Bulawayo, Zimbabwe. Baricholo attended Don Bosco primary School in Masvingo and in 1983 enrolled for his secondary education at Mucheke High School also in Masvingo. He completed his O'level studies in 1986 and was immediately engaged as a temporary teacher at Madzivanyika Secondary School by the Ministry of Education to teach Technical Drawing.

In 1987 Dr Baricholo enrolled for the Zimbabwe-Cuba teacher education programme and spend a year learning Spanish at Marymount Teachers College in Mutare. Upon successful completion of the Spanish Language Training course, Dr Baricholo went to Cuba in 1988 and studied for a Licenciate in Education specializing in Physics and Astronomy. He graduated in July 1993 and was immediately appointed a teacher at Gokomere High School in Masvingo where he taught A' Level Physics, A' level Computing, O' level Physical Science, O' level Integrated Science and ZJC Mathematics. He rose through the ranks and in 1996 became the Head of the Department of Science and the Deputy Sportmaster.

In 2000 Dr Baricholo graduated from the University of Zimbabwe with a Bachelor of Science Special Honours in Physics. In September 2001 He was appointed lecturer by the Ministry of Higher Education at Morgenster Teachers College. In August 2002 Dr Baricholo joined the Scientific Industrial Research and Development Centre as a Staff Development Fellow working in the Electronics Institute. Part of the duties were to study for a higher degree, hence enrolled for a Master of Philosophy Degree with the National University of Science and Technology (NUST).

In 2004, Baricholo was appointed by NUST as a Teaching Assistant in the Department of Applied Physics. In 2005 Baricholo received an African Laser Center research grant that enabled him to visit the Laser Research Institute at Stellenbosch University, South African for six months to complete his M. Phil Research. Upon completion of M. Phil studies in 2006, he was appointed lecturer in the Department of Applied Physics. His duties included teaching undergraduate Physics courses on the BSc Applied Physics and BSc Radiography programmes. In 2007, Baricholo enrolled for PhD studies at NUST under a sandwich programme with Stellenbosch University. He researched on novel excitation schemes for transversely excited carbon dioxide lasers and excimer lamps. He graduated in 2012 and in 2013 was appointed Senior lecturer in the Department of Applied Physics, a position he holds up to this day. He received training in Radiation Safety from the Radiation Protection Authority of Zimbabwe and was appointed Radiation Safety Officer for the University.

In 2012 Peter was appointed the Coordinator of RAF 1004 an AFRA technical cooperation project on industrial applications of radioisotopes. In 2014 he was requested to coordinate AFRANEST. Dr Baricholo is the current National Coordinator for RAF1008 and AFRANEST. He has actively participated in training workshops, fellowships, conferences and IAEA coordinated meetings. In 2013, Dr Baricholo successfully organized and hosted a training workshop on Residence Time Distribution in Klinker factory in partnership with PPC, a cement manufacturing company. In 2015, he organized and hosted the final coordination meeting for RAF1004 that was held at Bulawayo Rainbow hotel. In 2017, Dr Baricholo was appointed as the Chief Scientific Investigator for an IAEA Coordinated Research Project CRP F22069 in 2017. In 2019 he was appointed the project counterpart for RAF1008 as well as the Project's Scientific Consultant.

Peter was awarded in 2014 a TWAS Fellowship to facilitate research visits to Laser Research Institute, University of Stellenbosch for a total of 6 months over a period of 3 years. In 2016, Peter received an IAEA fellowship to receive training in gamma column scanning at CNESTEN of Morocco. This has enabled him to carry out gamma column scanning experiments in petrochemical industries in Zimbabwe. In 2018 Baricholo also received an IAEA fellowship to undergo training n Nuclear Electronics and Instrumentation in Algeria.

Since attaining his PhD, Dr Baricholo has worked on several projects related to Lasers and their applications. He has also been involved with IAEA projects on Industrial application of Radioisotope and has facilitated the establishment of a research group in this research area. He has presented several papers at national and international conferences. He is currently coordinating RAF0050 triangular regional project on Medical Physics.

CURRICULUM VITAE

Personal Details

Name:	Peter Baricholo, PhD
Gender:	Male
Residential Address:	7075 Chigwagwagwa St, Targets Kopje Masvingo, 1783 Mahatshula North, Bulawayo
Postal Address:	NUST, Department of Applied Physics, P. O. Box AC 939, Ascot Bulawayo
Cellphone Number:	cell: +263 774 668 882
E-mail Address:	pbaricholo@gmail.com, peter.baricholo@nust.ac.zw
Nationality:	Zimbabwean
National Identity Number:	22-114402-s-22
Date of Birth:	27 September 1969
Place of Birth:	Luveve Hospital, Bulawayo
Marital Status:	Married
Languages:	English, Spanish, Shona and Ndebele
Researchgate online profile:	https://www.researchgate.net/profile/Peter-Baricholo/stats
Google scholar citations:	https://scholar.google.com/citations?user=G4g6874AAAAJ&hl=en
ORCID ID	https://orcid.org/0000-0002-7421-1009
Current Salary:	ZWL$312251.00
Date of Availability:	3 Months' notice to be given to current employer

Current Research Interest

- Industrial application of Radioisotopes; Gamma column and pipe scanning, laminography and residence time distribution
- Radon mapping
- Simulation of Mid Infrared Supercontinuum Generation in Silicon Germanium Photonic Waveguide
- Photonics and Laser development

Academic Training and Professional Work

i. Institution attended with degrees/certificates

2007 - 2012

Doctor of Philosophy, NUST, Zimbabwe
Dissertation title: Development of novel discharge excitation schemes and switching technology for small TEA CO_2 laser and excimer lamps and their possible applications.

2002 - 2006

Master of Philosophy (Lasers and Applied Optics), NUST, Zimbabwe.
Dissertation title: Design, fabrication and characterization of a locally made CO_2 gas laser

2000 -2001

Bachelor of Science (Special Honours in Physics) Degree class: 2.1, University of Zimbabwe, Zimbabwe.
Project Title: Design and development of a Kelvin bridge for measuring small resistances.

1988- 1993

Licenciate in Education (Physics and Astronomy), Degree class: Gold Seal, ISP Jose Varona, Cuba

PROFESSIONAL QUALIFICATIONS

- Licenciate in Education (Physics and Astronomy), Degree class: Gold Seal, ISP Jose Varona, Cuba, 1993.
- Crest-Online PhD Supervision course, University of Stellenbosch, 2019.

Membership to Professional Bodies

Optical society of America (OSA)

Institute of Physics (IOP)

South African Institute of Physics (SAIP)

International Atomic Energy Agency (IAEA)

ICARST

African Laser Center

Zimbabwe Institute of Physics (ZIoP)

RELEVANT EMPLOYMENT EXPERIENCE

- **Research**

September 2012 to date

Visiting Researcher, Laser Research Institute, Stellenbosch University, South Africa. *Laser development, simulations and applications.*

September 2018 to Date

Project coordinator RAF1008 *Supporting Radiation Technologies in Industrial Applications and Preventive Maintenance of Nuclear and Medical Equipment (AFRA)*

November 2017 to Date

Chief Scientific Investigator for CRP F22069 *Imaging technologies for process investigation and component testing*.

June 2014 to Date

Project coordinator AFRANEST *AFRA Network for Nuclear Education, Science and Technology*

September 2011 to 2014

Project Coordinator for RAF1004 *Supporting Radioisotope Technology as a tool for Plant Process Performance, Optimization and Troubleshooting*

October 2008 to April 2009

Visiting Researcher, CSIR-National Laser Centre. *Develop a micromachining setup for use with the femtosecond laser.*

August 2002 to August 2004

Staff Development Fellow, Scientific, Industrial, Research and Development Center (SIRDC). *Develop a carbon dioxide laser and a switched mode power supply to pump the laser. Develop electronic circuits with the group in the Electronics Institute. Science Laboratory Teaching Equipment (SLATE) project which resulted in commercialization of the Laboratory equipment.*

- **Teaching**

July 2014 to date

Senior Lecturer in Applied Physics Department, National University of Science and Technology (NUST). *Teaching Applied Physics courses being offered by the Department at both undergraduate and post graduate level. Acted as Chairperson of the Applied Physics Department (October 2019 – 30 October 2020). Supervised undergraduate final year projects, MSc. research projects and M.Phil. students pursuing their studies by research. Supervise and assess student on industrial attachment.*
Carry out outreach activities/community service activities such as teaching physics to high school students under the NUST schools enrichment programme (NUSTSEP).
Assist local industries optimize their processes and trouble shoot using residence time distribution in cement manufacturing and using gamma column scanning techniques in petrochemical industries.
Coordinate activities with stakeholders towards the establishment of a National Non-Destructive Testing and Certifying Body.

July 2006 to June 2014

Lecturer in Applied Physics Department, National University of Science and Technology (NUST). *Teaching Applied Physics courses being offered by the Department at both undergraduate and post graduate level. Supervise undergraduate final year projects and post-graduate students pursuing their studies by research. Supervise and assess student on industrial attachment. Act as Chairperson of*

Department. Carry out outreach activities such as teaching A' level Physics to high school students under the NUST schools enrichment programme (NUSTSEP).

September 2004 to July 2006
Teaching Assistant in Applied Physics Department, National University of Science and Technology (NUST).
Supervise undergraduate laboratory. Give tutorials to students on the Applied Physics programme.

October 2001 to August 2002
Lecturer, Morgenster Teachers' College, Masvingo. Ministry of Higher and Tertiary Education. *Teaching Environmental Science to primary school trainee teachers.*

September 1993 to September 2001
Teacher Ministry of Education, Sport and Culture. Gokomere High School, Masvingo, Zimbabwe
Teach A' Level Physics, O' Level Physical Science and Mathematics. Marking of the A'Level ZIMSEC Physics Practical paper.

March to September 1987
Temporary Teacher, Ministry of Education, Sport and Culture, Madzivanyika Secondary School, Masvingo.
Teaching O' Level Technical Drawing.

Fellowships and Received Research Grants

1. African Laser Center annual collaborative research Grant valued at R110 000 awarded in 2022.
2. African Laser Center annual collaborative research Grant valued at R110 000 awarded in 2021.
3. African Laser Center annual collaborative research Grant valued at R110 000 awarded in 2011 upto 2019. Application is renewed annually upon submission of a satisfactory report.
4. IAEA fellowship on Nuclear Instrumentation, Birine, Algeria.
5. IAEA Contract research grant valued at 16 000 euros awarded for the period 2018 - 2021 and 4000 Euros is paid annually upon submission of a satisfactory progress report.
6. NUST Research board grants awarded in 2013, 2015, 2017.
7. IAEA Fellowship on Gamma Column and Pipe Scanning awarded in 2016.
8. TWAS Fellowship awarded in 2014 to facilitate research visits to Laser Research Institute, University of Stellenbosch for a total of 6 months over a period of 3 years.

Supervised Postgraduate Research M. Phil. students

1. James Jena, *Simulation of electromagnetic propagation in photonic crystal fibers*, National University of Science and Technology, Faculty of Applied Science, Department of Applied Physics, October 2017.
2. Suliali Joseph Nyasha, *Development of an Optical Coherence Tomography system and its application in surface morphology imaging of an optical material*, National University of Science and Technology, Faculty of Applied Science, Department of Applied Physics, June 2017.

Supervised MSc Medical Physics Research projects

1. Audrey Tuturu, Establishment of diagnostic reference levels in Nuclear Medicine at Mpilo Central Hospital, National University of Science and Technology, Faculty of Applied Science, Department of Applied Physics, August 2019.
2. Takura Musiyarira, Development of an in-house EPIDs based in vivo dosimetry system for Mpilo Central Hospital, National University of Science and Technology, Faculty of Applied Science, Department of Applied Physics, August 2017.
3. Sindiso Ncube, Evaluation of neutron dose equivalent at the Maze entrance of facilities with 10 MV XRAY LINACs using FLUKA Monte Carlo Simulations, Physical Measurements and Semi-Empirical Methods, National University of Science and Technology, Faculty of Applied Science, Department of Applied Physics, August 2017.
4. Audrey Tuturu, Optimization of protection for Adult Patients in the Nuclear Medicine Department at Mpilo Central Hospital, National University of Science and Technology, Faculty of Applied Science, Department of Applied Physics, September 2020.

5. Sandra Mazviita Mutasa, Monte Carlo Evaluation of Dose Perturbation Effects of Metallic Hip Prostheses during External Beam Pelvic Radiotherapy, National University of Science and Technology, Faculty of Applied Science, Department of Applied Physics, October 2021.
6. Nqabutho Sibanda, Beam matching two medical linear accelerators (linacs) for patient transferability within treatment centers without adjustment of the original treatment plan**,** National University of Science and Technology, Faculty of Applied Science, Department of Applied Physics, October 2021.

Presented Papers at International Conferences and Workshops

1. Chirume W, **Baricholo P**. Alami R., Muchono B., Mudono S., Dzingai C and R. T. Mashingaidze, Gamma computed laminography: A troubleshooting tool for distillation columns, ICARST 2022, 22 – 26 August 2022, Vienna International Convention Center, Vienna, Austria.
2. Chirume W, **Baricholo P**. Alami R., Muchono B., Mudono S., Dzingai C and R. T. Mashingaidze, Investigation of malfunctions in a laboratory prototype and industrial distillation columns using gamma column scanning technique, ICARST 2022, 22 – 26 August 2022, Vienna International Convention Center, Vienna, Austria.
3. P. Munsaka, **P. Baricholo**, E. Rohwer and G. W. Bosman. Simulation of Supercontinuum Generation in Silicon Germanium Photonic waveguide, Frontiers in Optics and Laser Science Technical Conference, Virtual event, 1 to 4 November 2021, JTu1A.111, www.frontiersinoptics.com/home/posters
4. Chirume W, **Baricholo P**. Alami R., Muchono B., Mudono S., Dzingai C and R. T. Mashingaidze, Investigation of the benzole prefractionator distillation column using gamma ray scanning technique, 64th South African Institute of Physics Conference, Venda University, Polokwane, 8th to 12th July 2019. http://events.saip.org.za/conferenceDisplay.py/abstractBook?confId=144
5. Chirume W, **Baricholo P.**, Alami R. and Mudono S., Fluka Monte Carlo simulation of gamma photon transport through a distillation column, designed using ChemSep software 64th South African Institute of Physics Conference, Venda University, Polokwane, 8th to 12th July 2019. http://events.saip.org.za/conferenceDisplay.py/abstractBook?confId=144
6. Nyasha J. Suliali, **Peter Baricholo**, Pieter H. Neethling and Erich G. Rohwer, Non-Destructive Surface Profilometry by First Reflection Localization Using Spectral Domain Optical Coherence Tomography, 26th to 29th June 2017, SPIE Optical Metrology International Symposium in Munich, Germany.
7. **Peter Baricholo**, Cyril Siringwani, Ignatius Tichivangani and RAF/1/004 participants. Industrial application of radioisotopes in Zimbabwean industries: a report on RTD experiments in cement industry, Radon monitoring in coal and fly ash of a small thermal power plant and NDT activities, 1st International Conference on Applications of Radiation Science and Technology, ICARST 2017, 24th – 28th April 2017, Vienna International Center, Vienna, Austria.
8. James Jena, **Peter Baricholo**, Temba Dlodlo and Paul Buah Bassuah, *Supercontinuum generation in birefrigent photonic crystal fibre*, 61th Annual conference of the South African Institute of Physics, hosted by the University of Cape Town, Cape Town, South Africa, 4th to 8 July 2016.
9. Suliali N. J., **Baricholo P.,** Neethling P. H. and E. G. Rohwer. *Development of a free space LED-illuminated spectral domain optical coherence tomography setup,* 61th Annual conference of the South African Institute of Physics, hosted by the University of Cape Town, Cape Town, South Africa, 4th to 8 July 2016.
10. Suliali, N.J., **Baricholo, P.,** Neethling, P. H. and E.G. Rohwer. Development of a Helium-Neon laser illuminated Michelson interferometer for micron-scale displacement measurements, *Research Intellectual Output - Science, Engineering and Technology*, 13 – 17 July 2015. National University of Science and Technology, Bulawayo, Zimbabwe.
11. James Jena, **Peter Baricholo**, Temba Dlodlo and Paul Buah Bassuah, Simulation of a dispersion profile of a hollow core photonic crystal fiber, *Research Intellectual Output - Science, Engineering and Technology*, 13 – 17 July 2015. National University of Science and Technology, Bulawayo, Zimbabwe.
12. Suliali, N.J., **Baricholo, P.,** Neethling, P. H. and E. G. Rohwer. Simulation and measurement of Spectral Domain Optical Coherence Tomography interferograms using a broadband CW light source, *ALC Laser Workshop on Spectroscopy*, 30 November – 2 December 2015, Stellenbosch, South Africa.
13. Suliali, N.J., **Baricholo, P.,** Neethling, P. H. and E. G. Rohwer. Development of a free space Spectral Domain Optical Coherence Tomography setup for 1D imaging of single surfaced reflectors, *8th Annual ALC Student Workshop*, 2 –4 December 2015, Cape Town, South Africa.
14. Suliali N. J., **Baricholo P.,** Neethling P. H. & Rohwer E. G. (2014). Surface morphology modelling using Michelson's interferometer for an Optical Coherence Tomography system. *Proceedings of the Research*

Intellectual Expo – Science, Engineering and Technology. University of Zimbabwe, ZW. Book of Abstracts for Poster Presentations pp. 26.

15. Suliali N. J., **Baricholo P.,** Neethling P. H. and E. G Rohwer. Interference fringe intensity measurement by optical path length variation using Michelson's interferometer. *Proceedings of the 59th Annual South African Insitute of Physics Conference*. University of Johannesburg, RSA. Book of Abstracts for Oral Presentations pp.65., July 2014.
16. Suliali N. J., **Baricholo P.,** Neethling P. H. & Rohwer E. G. (2014). Gas refractive index and Sodium D-line separation measurement using Michelson's interferometer. *Proceedings of the Siegman International School on Lasers.* Stanford University, California, USA. Book of Abstracts for Poster Presentations pp. 9.
17. James F Jena, Temba S Dlodlo, Paul K Buah Bassuah and **Peter Baricholo**, Solving the Nonlinear Schrödinger Equation Using the Symmetrised Split Step Fourier Method, *SAMSA Conference held in Victoria Falls, Zimbabwe* as from the 24th to 28th of November 2014.
18. **Baricholo P**, Blessed Muchono, Andreas Hills, Jovan Thereska and IAEA workshop participants, Investigation of the operation efficiency of a raw material grinding mill for clinker production at PPC Colleen Bawn factory in Zimbabwe using a radiotracer, TRACER 7, Seventh International Conference on Tracers and Tracing methods, Marrakech, Morocco, 13th to 15 October 2014.
19. Jena F. J., Dlodlo T. S., Buah-Bassuah P. K. and **P. Baricholo**. Propagation Characteristics Control by Variation of PCF Structural Parameters. *Proceedings of the 59th South African Institute of Physics Annual Conference.* D-LES 102, University of Johannesburg, SA., 2014.
20. Jena F. J., Dlodlo T. S., Buah-Bassuah P. K. and **P. Baricholo**. Simulation of Electromagnetic Wave Propagation in Photonic Crystal Fibers. *Proceedings of the Reseacrh Intellectual Expo-Science Engineering and Technology, RIE-SET 2014.* University of Zimbabwe, ZW, 2014.
21. Suliali N. J., **Baricholo P.,** Neethling P. H. and E. G. Rohwer. Surface morphology modelling using Michelson's interferometer for an Optical Coherence Tomography system. *Proceedings of the National University of Science & Technology First Annual Research Day.*NUST, ZW. Book of Abstracts for Oral Presentations pp.11., 2013.
22. Suliali N. J., Rohwer E.G., Neethling P. H. and **P. Baricholo.** *Interference fringe intensity measurement by optical path length variation using Michelson's interferometer*. African Laser Center – Stellenbosch 2013 student workshop, Zevenwatch wine Estate, Stellenbosch, South Africa, 22 - 24 November 2013.
23. Jena F. J., Dlodlo T. S., Buah-Bassuah P. K. and **P. Baricholo**. Simulation of Electromagnetic Wave Propagation in Photonic Crystal Fibers. *Presentation at the National University of Science & Technology 1st Annual Research Day 2013.* Book of Abstracts pp.12. Council Chambers, NUST, ZW.
24. **Baricholo P**, W. Ndebeka, P. Neethling, A. Heidt and E. G. Rohwer. *Experimental studies on spectral broadening and polarization state of white light generated in a laterally stressed photonic crystal fibre*, African Laser Center Student workshop, University of Namibia, Safari Hotel, Windhoek, Namibia14 -17 November 2012.
25. **Baricholo P**, Stehmann T, Rohwer E G, Collier M, Hlatywayo D J and H M von Bergmann. *Dielectric barrier discharge CO_2 TEA laser operated at frequencies upto 400 Hz* presented at African Laser Center – Stellenbosch 2011 Symposium, Zevenwatch wine Estate, Western Cape, South Africa, 9 - 12 September 2011.
26. **Baricholo P**, Stehmann T, Rohwer E G, Collier M, Hlatywayo D J and H M von Bergmann. *Dielectric barrier discharge CO_2 TEA laser operated at frequencies upto 400 Hz*, presented at 56th Annual conference of the South African Institute of Physics, hosted by Department of Physics, University of South Africa (UNISA), St George Hotel, Gauteng, South Africa, 12 – 15 July 2011.
27. H. M. von Bergmann, **P. Baricholo**, T. Stehmann. *Direct comparison of spark and corona preionization in a small size, solid state switched high repetition rate CO_2 TEA laser*. XVIII International Symposium on gas flow and chemical lasers and high power lasers 2010, Sofia, Bulgaria, August 30 – September 3, 2010.
28. **Baricholo P**, Hlatywayo D J, Von Bergmann H M, Stehmann T, Rohwer E and M Collier. *Electrical and optical characterization of dielectric barrier discharge excited Ar excimer lamp systems and it applications.* This paper was presented at the African Laser Center – Stellenbosch 2010 Symposium, Zevenwatch Wine Estate, Stellenbosch, South Africa, 23 - 26 September 2010.
29. **Baricholo P**, Hlatywayo DJ, Von Bergmann HM, Stehmann T, Rohwer E, Collier M. *Electrical characterization of an Ar_2* excimer lamp excited by a dielectric barrier discharge.* This poster was presented at the 55th Annual Conference of the South African Institute of Physics, hosted by the CSIR-NLC at the CSIR International Convention Center; 27 September to 1 October 2010.
30. **Baricholo P**, Hlatywayo DJ, Von Bergmann HM, Stehmann T, Rohwer E, Collier M. *Development of dielectric barrier discharge lamp systems for sterilization and exhaust gas remediation.* This poster was presented at Conclave of Afro-Asia young scientists, February 11 – 13 2010. This poster won the prize of the Best Poster presentation.

31. **Baricholo P**, Hlatywayo D J, Von Bergmann H M, Stehmann T, Rohwer E and M Collier. *Dielectric barrier discharge excited CO_2 laser and excimer lamp systems and applications of ultrafast lasers to materials processing.* This paper was presented at the African Laser Center – Kariega 2009 Symposium, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa, 2 - 5 July 2009.
32. **Baricholo P**, Hlatywayo DJ, Von Bergmann HM, Stehmann T, Rohwer E and M Collier. *Dielectric barrier discharge excited CO_2 laser and excimer lamp systems for materials processing.* This paper was presented at the 54th South African Institute of Physicists Conference held at University of KwaZulu-Natal, Durban, 6 – 10 July 2009.
33. **Baricholo P**, Steyn J, A. Du Plessis, H. M. von Bergmann. *Femtosecond laser microhole drilling and dot matrix printing on human hair.* This poster was presented at the 54th South African Institute of Physicists Conference held at University of KwaZulu-Natal, Durban, 6 – 10 July 2009.
34. **Baricholo P**, Hlatywayo DJ, Von Bergmann HM, Stehmann T, Rohwer E, Collier M. *Experimental investigation of factors influencing spatial distribution of micro-discharges in non-thermal plasmas*. Poster presented at the First International Conference on Laser and Plasma applications in Materials Science, Centre de Developpment des Technologies Avances, Algiers, Algeria, 23rd -26th June 2008.
35. **Baricholo P**, B Muchono, M Hubertus and D J Hlatywayo. Optimisation of the food processing and detection of contamination using the tracer and the neutron activation techniques, *Proceedings of the First project conference on Radioisotope Applications for Troubleshooting and Optimising Industrial Processes*. Ghana Atomic Energy Commission, Accra, Ghana,16 – 20 June 2008, Page 24.
36. **Baricholo P**, Hlatywayo D J, Von Bergmann H M, Stehmann T, Rohwer E and M Collier. *Experimental investigation of factors influencing spatial distribution of micro-discharges in non-thermal plasmas*. This paper was presented at the African Laser Center – Kariega 2008 Symposium, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa, 7-9 May 2008.
37. **Baricholo P**, Hlatywayo D J, Von Bergmann H M, Stehmann T, Rohwer E and M Collier. *Experimental investigation of factors influencing spatial distribution of micro*-discharges *in non-thermal plasmas.* 53rd SAIP conference, hosted by the University of Limpopo, Polokwane, South Africa as from 9th to 11 July 2008.
38. **Baricholo P**, Hlatywayo DJ, Von Bergmann HM, Stehmann T, Rohwer E and M Collier. *Experimental study of design parameters of longitudinally excited CO_2, TEA CO_2 lasers and of dielectric barrier discharges as the excitation mechanisms for TEA CO_2 lasers.* 52nd South African Institute of Physicists Conference held at University of Witswatesrand, Johannesburg, South Africa, 2 – 5 July 2007.
39. **Baricholo P**, Hlatywayo D J, Von Bergmann H M, Stehmann T, Rohwer E and M Collier. *Experimental study of design parameters of dielectric barrier discharges as the excitation mechanism for compact TEA CO_2 lasers to be used for medical and environmental applications.* OPTOLASERMED2007, University of Cape Coast, Ghana, 19 – 24 November 2007.
40. **Baricholo P**, M. Mathuthu, Carelse X. F., Von Bergmann HM, A. V. Gholap. *Design, development and characterization of a longitudinally excited CO_2 gas laser system for medical and research applications.* This poster was presented at the 6th Edward Bouchet and Abdus Salam (EBASI) International Conference Physics and Technology for Sustainable Development for Africa, iThemba Labs, Western Cape, South Africa from 24 - 26 January 2007.
41. **Baricholo P**, M. Mathuthu, Carelse X. F., Von Bergmann H. M., A. V. Gholap. *Design, development and characterisation of a CO_2 gas laser system for medical and research applications*. 2nd International conference on appropriate technology organized by The National University of Science and Technology and was held at the Bulawayo Rainbow Hotel as from 12th to 15 July 2006.
42. **Baricholo P**, M. Mathuthu, Carelse X. F., A. V. Gholap. *Design and development of a CO_2 gas laser and pumping system for industrial and research applications.* International workshop on application of lasers and conference on lasers and optics which was held in Windhoek Namibia as from 12 August 2003 to 17 August 2004.
43. Gholap A. V. and **P. Baricholo**, *Nitrogen gas laser: An appropriate technology tool for developing countries in Africa*. International conference on appropriate technology, National University of Science and Technology, Bulawayo Rainbow hotel, Bulawayo, 15th to the 17th of July 2004.

Technical Reports

1. Technical report on CRP F22069 Imaging Technologies For Process Investigation and Components Testing, submitted to the International Atomic Energy Agency on 28 November 2022.
2. Technical report on Gamma Column scanning Experiments performed on the Distillation and Fractionating columns of the Tar plant at Zimchem Refineries, submitted to Zimchem Refineries, Redcliff in November 2022.
3. RAF1008 Annual project evaluation report on "Supporting Radiation Technologies in Industrial Applications and Preventive Maintenance of Nuclear and Medical Equipment (AFRA)" submitted to the Atomic Energy Agency in January 2022.

4. RAF1008 Annual project evaluation report on "Supporting Radiation Technologies in Industrial Applications and Preventive Maintenance of Nuclear and Medical Equipment (AFRA)" submitted to the Atomic Energy Agency in January 2021.
5. RAF1008 Annual project evaluation report on "Supporting Radiation Technologies in Industrial Applications and Preventive Maintenance of Nuclear and Medical Equipment (AFRA)" submitted in April 2020.
2. Technical report on Supporting radiation technologies in industrial applications and preventive maintenance of nuclear and medical equipment (AFRA), submitted to IAEA in February 2020. Primary project function is "Industrial applications of radiosotopes and preventive maintenance of nuclear and medical equipment".
3. Technical report on Gamma Column scanning Experiment performed on the BTX plant at Zimchem Refineries, submitted to Zimchem Refineries, Redcliff in April 2019.
4. Technical report on CRP F22069 Imaging Technologies For Process Investigation and Components Testing, submitted to the International Atomic Energy Agency, during the First coordination meeting, VIC, Vienna, Austria, 11 to 15 February, 2019.
5. Technical report on Development of an Optical Coherence Tomography setup and its application in the investigation of surface morphology of certain materials, submitted to the African Laser Center, National Laser Center CSIR, Pretoria, South Africa in 2018.
6. Technical report on Development of an Optical Coherence Tomography setup and its application in the investigation of surface morphology of certain materials, submitted to the African Laser Center, National Laser Center CSIR, Pretoria, South Africa in 2017.
7. Technical report on Development of an Optical Coherence Tomography setup and its application in the investigation of surface morphology of certain materials, submitted to the African Laser Center, National Laser Center CSIR, Pretoria, South Africa in 2016.
8. Technical report on Development of an Optical Coherence Tomography setup and its application in the investigation of surface morphology of certain materials, submitted to the African Laser Center, National Laser Center CSIR, Pretoria, South Africa in 2015.
9. Technical report on Development of an Optical Coherence Tomography setup and its application in the investigation of surface morphology of certain materials, submitted to the African Laser Center, National Laser Center CSIR, Pretoria, South Africa in 2014.
10. Technical report on Investigation of effect of laterally stressing a photonic crystal fibre on the polarization state of the Super continuum generated, Laser Research Institute, Stellenbosch University, South Africa, submitted in 2013.
11. Technical report on Confocal microscopy project presented to the African Laser Center, Pretoria, South Africa in 2012.
12. Technical report on Confocal microscopy project presented to the African Laser Center, Pretoria, South Africa in 2011.
13. Technical report on Femtosecond laser microhole drilling project presented to the National Laser Center CSIR, Pretoria, South Africa in 2008.

Publications

1. P. Munsaka, **P. Baricholo**, E. G. Rohwer, and G. W. Bosman, "Mid Infared Supercontinuum generation in silicon germanium photonic waveguide", Optics Continuum, Vol. 2, Issue 1, January 15 2023, pages 9 – 20. https://opg.optica.org/DirectPDFAccess/A8B8D99C-7E91-43C4-8598EB94297EE82A_524442/optcon-2-1-9.pdf?da=1&id=524442&seq=0&mobile=no
2. P. Munsaka, **P. Baricholo**, E. G. Rohwer, and G. W. Bosman, "On-Chip Mid-Infrared Supercontinuum Generation in Silicon Germanium waveguide," in *Frontiers in Optics + Laser Science 2022 (FIO, LS)*, Technical Digest Series (Optica Publishing Group, 2022), paper JTu5B.41. https://opg.optica.org/abstract.cfm?URI=LS-2022-JTu5B.41
3. P. Munsaka, **P. Baricholo**, E. G. Rohwer, and G. W. Bosman, "Simulation of Mid Infrared Supercontinuum Generation in Silicon Germanium Photonic Waveguide," in *Frontiers in Optics + Laser Science 2021*, C. Mazzali, T. (T.-C.) Poon, R. Averitt, and R. Kaindl, eds., Technical Digest Series (Optica Publishing Group, 2021), paper JTu1A.111. https://www.osapublishing.org/abstract.cfm?URI=FiO-2021-JTu1A.111
4. **P. Baricholo**, Witness Chirume, Blessed Muchono, Robin Mashingaidze, Stanford Mudono, Caven Dzingai, Rachad Alami, 2019, Gamma column scanning services for Zimbabwe, ISTRA Newsletter, https://istra-society.org/newsletter-123.html?file=files/tao/documents/newsletter/ISTRA_newsletter004_GammaColumnScanning_Zimbabwe_2019_03.pdf&cid=1703
5. N. J. Suliali, **P. Baricholo**, P. H. Neethling, and E. G. Rohwer, "Non-Destructive Surface Profilometry By First Reflection Localization Using Spectral Domain Optical Coherence Tomography," in *Imaging and*

Applied Optics 2017 (3D, AIO, COSI, IS, MATH, pcAOP), OSA Technical Digest (online) (Optical Society of America, 2017), paper JTu5A.29. **https://www.osapublishing.org/abstract.cfm?URI=3D-2017-JTu5A.29**

6. Nyasha J. Suliali ; **Peter Baricholo** ; Pieter H. Neethling and Erich G. Rohwer " Development of a low-cost, 11 µm spectral domain optical coherence tomography surface profilometry prototype ", *Proc. SPIE* 10329, Optical Measurement Systems for Industrial Inspection X, 103292Q (June 26, 2017); doi:10.1117/12.2268064; **http://dx.doi.org/10.1117/12.2268064**
7. Suliali N. J., **Baricholo P**., Neethling P. H. and Rohwer E. G. (2017). Development of a free space, LED-illuminated spectral domain optical coherence tomography setup. *Universal Journal of Physics and Application*, 11(**3**) Horizon Research Publishing. http://www.hrpub.org/download/20170930/UJPA6-18409570.pdf
8. Suliali N. J., **Baricholo P**., Neethling P. H. and Rohwer E. G. (2017). Image resolution analysis by varying interpolation degree of k-space spectra. *Proceedings of the Biophotonics 2017 Graduate Summer School*, Island of Ven, ***DK***.
9. James F Jena, **Peter Baricholo**, Temba S Dlodlo and Paul K Buah-Bassuah. Propagation characteristics control by variation of PCF structural parameters in Proceedings of SAIP2014, the 59th Annual Conference of the South African Institute of Physics, University of Johannesburg, Johannesburg, 2014), pp. 2 - 7. ISBN: 978-0-620-65391-6. Available online at http:\\www.saip.org.za
10. **Baricholo P**, Hlatywayo D J, H M von Bergmann, Stehmann T, Rohwer E and M Collier. Influence of gas discharge parameters on emissions from a dielectric barrier discharge excited argon excimer lamp. South African Journal of Science, 2011; 107 (11/12), Art. #581, 7 pages. http://dx.doi.org/10.4102/sajs.v107i11/12.581
11. **Baricholo P**, Stehmann T, Rohwer EG, Collier M, Hlatywayo DJ, Von Bergmann HM. Dielectric barrier discharge CO_2 TEA laser operated at frequencies upto 400 Hz, in Proceedings of SAIP2011, the 56th Annual Conference of the South African Institute of Physics, edited by I. Basson and A. E. Botha (University of South Africa, Pretoria, 2011), pp. 2 - 7. ISBN: 978-1-86888-688-3. Available online at http:\\www.saip.org.za
12. **Baricholo P**, B Muchono, M Hubertus and D J Hlatywayo. Optimisation of the food processing and detection of contamination using the tracer and the neutron activation techniques, *Proceedings of the First project conference on Radioisotope Applications for Troubleshooting and Optimising Industrial Processes*. Ghana Atomic Energy Commission, Accra, Ghana,16 – 20 June 2008, Page 24.
13. **Baricholo P**, M. Mathuthu, Carelse X. F., H. M. von Bergmann and A. V. Gholap. *Design, development and characterisation of a CO_2 gas laser system*. Journal of Applied Sciences for Southern Africa (JASSA), Vol. 12, Issue 1, 2006.
14. Gholap A. V and **P. Baricholo**, Nitrogen gas laser: An appropriate technology tool for developing countries in Africa, in Proceedings of The First International Conference on Appropriate Technology, 15-17th July, 2004, Bulawayo, Zimbabwe. http://www.dcmetrosftp.org/appropriate%20tech/AT%20articles/Proceedings1stInternationalConferenceOnAppropriateTechnologyZimbabwe2004.pdf

Books

1. **P. Baricholo** and H. M. von. Bergmann. (2010), Development of a longitudinally excited continuous wave CO_2 laser, LAP Lambert academic publishing GmbH & Co. KG, Saarbrucken , 22 cm. ISBN: 978 - 3-8383-8420-7

External Examiner/Assessor

2020 – External Examiner of MSc and PhD Theses, Faculty of Natural and Agricultural Sciences, University of Western Cape, South Africa

2022 - External Examiner of MSc and PhD Theses, Faculty of Natural and Agricultural Sciences, University of Western Cape, South Africa

2023 - External Examiner of MSc and PhD Theses, Faculty of Natural and Agricultural Sciences, University of Western Cape, South Africa

Reviewer

2022 - Programme reviewer for National Council for Higher Education, Namibia

2021 - SAIP 2021 conference proceedings reviewer for manuscript #127.

2021 – Programme reviewer for Zimbabwe Council for Higher Education

2014 – Zimbabwe Journal of Science and Technology, NUST, Bulawayo, Zimbabwe

REFEREES

1. Engr Benson Munyaradzi
   Director Power Development
   Ministry of Energy and Power Development
   John Boyne Building
   Innez Terrace & Speke Avenue
   Private Bag 7758, Causeway
   Harare
   Phone +263 4 797952 Cell +263 712880 633
   Email: bensonmunyaradzi@gmail.com

2. Prof D. J. Hlatywayo
   Applied Physics Department
   National University of Science and Technology
   P. O. Box AC939
   Ascot
   Bulawayo
   e-mail: dumisani.john.hlatywayo@nust.ac.zw
   djhlatywayo@gmail.com

3. Dr. S. Haile
   Project Management Officer
   International Atomic Energy Agency (IAEA)
   Department of Technical Cooperation
   Vienna International Centre,
   P. O. Box 100
   Vienna
   Austria
   email: S.Haile@iaea.org
   Tel: (+43-1)2600 22332
   Cell: +43 660 759 2426