

CURRICULUM OF VITAE DR. BUYISIWE M. SONDEZI

Senior Lecturer at the University of Johannesburg

BRIEF PROFILE

I'm currently a Senior Lecturer of Physics at the University of Johannesburg (UJ). I hold a PhD (Physics), being the **First Woman in Africa** to be awarded this degree in the field of **Experimental Physics of Highly Correlated Matter**. The day-to-day activities involve lecturing physics at undergraduate levels and performing research in the field of condensed matter physics, particularly on the properties of Rare Earth materials, including their synthesis and treatments. These are followed by accurate characterization and measurements, which includes magnetic (magnetization and magnetic susceptibility), thermal transport (specific heat and thermal conductivity), electrical transport (electrical resistivity) and structural properties of the materials synthesized.

I'm very decisive and confident, have the ability to work well with people. This originated from extensive experience in lecturing at UJ and as scientist at NECSA where there is a lot of interaction with the undergraduate as well as postgraduate students. Working with individuals of different personalities also stems from my involvement in our current church activities where I exercise a leadership role. I also have good organizational skills and the ability to work well under pressure as an individual and/or in a team member.

PERSONAL DETAILS

ID number	7603160304089
Date of birth	16 March 1976
Gender	Female
Address	906 Corlett Street Witpoortjie, Roodepoort 1724 South Africa
Home language	Zulu
Second language	English
Nationality	South African
Driver's license	Code EC2
Dependents	2
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TERTIARY EDUCATION

2006 to 2014:	PhD Year graduated Field of specialization	University of Johannesburg, 2014 Physics (Condensed Matter Physics, Rare Earth Materials)
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Specialized in Condensed Matter Physics, specifically in the field of Experimental Physics of Highly Correlated Matter, researching the behavior of Rare Earth Magnetic Materials under extreme conditions such as ultra-low temperatures, high-applied magnetic fields and high pressure. Various properties of these materials, starting from structural characterization, to physical, magnetic, electrical and thermal transport, and are amongst those that were continually studied.

2003 to 2004	MSc Degree Year graduated Field of specialization	Rand Afrikaans University 2005 Physics (Condensed Matter Physics, Solar Cells)
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Research Area

Research included the deposition and characterization of single phased, homogenous and highly efficient layers thin films. These were fabricated from the elements, Cu, In, Ga and Se, to produce an efficient Cu(In,Ga)Se₂ solar cell devices. This work was pertaining thin film technology where optimum thin film growth conditions of these quaternaries had to be successfully deposited.

2002 to 2003	B.Sc. Hons (Physics) Year graduated	Rand Afrikaans University. 2003
1999 - 2001	BSc. Degree Year graduated 2002 Major Courses	Vista University. Chemistry, Physics and Statistics

EMPLOYMENT HISTORY

CURRENT

University of Johannesburg

2016 – Present

Senior Lecturer (FT, Permanent)
Physics department

Activities

- Lecturing Physics to undergraduate students
Students enrolled for BSc. Extended Degree (Four Year Degree), Physics for Life Sciences, Physics for Engineers
The responsibilities included
(1) Structuring of the first year four year degree courses as well as Life Sciences Course.

- (2) Development of study guides for both theory and practical components.
- (3) Development of practical guide for Physics 2 and Physics 3.
- Research in Condensed Matter Physics, Studying Rare Earth Materials, particularly Ce-based Ferromagnetic Compounds).
- Research on gallium rich compounds. In this research, the compounds under investigation do not have established ordering temperatures. As part of investigation is to establish their electronic and magnetic ground state as well as their ordering temperatures.
- Supervision of undergraduate and postgraduate students research projects (10 Undergraduate Students who were taken into Undergraduate Research, 2 MSc Students (Completed), and 1 PhD student (still busy))

August 2007 - 2016

Senior Lecturer (FT, Permanent)
Physics department

Activities

- Lecturing Physics to undergraduate students
Students enrolled for BSc. Extended Degree (Four Year Degree), Physics for Life Sciences, Physics for Engineers
The responsibilities included
 - (4) Structuring of the first year four year degree courses as well as Life Sciences Course.
 - (5) Development of study guides for both theory and practical components.
 - (6) Development of practical guide for Physics 2 and Physics 3.
- Supervision of undergraduate and postgraduate students research projects (10 Undergraduate Students who were taken into Undergraduate Research, 2 MSc Students, and 1 PhD student)

Jan-April 2005

Junior Lecturer (FT, Permanent)
Physics department

Activities

Co-Lecturing Fundamental Physics classes
Worked as a lab demonstrator for the **2nd year Physics Practicals** at RAU.

EMPLOYMENT HISTORY 2

SOUTH AFRICAN NUCLEAR ENERGY CORPORATION (NECSA)

May 2005 – July 2007

Scientist (FT, Permanent) at NECSA in Radiation Utilization Division.

Activities

Activities involved sample preparation for powder x-ray diffraction and neutron diffraction measurements. The measurements step was followed by analysis of data and reports were written for both the clients and for scientific purposes. The last part of the activities before leaving NECSA, involved the purchasing of a cryostat for low temperature measurements. This involved constant communication with suppliers to in trying to purchase suitable components for the equipment.

ADDITIONAL WORK EXPERIENCES

2003 - 2004

Demonstrating the 2nd years **Physics Practicals** and tutoring the Fundamental Physics class at RAU.

RESEARCH INSTITUTES VISITED

1. Visited Inelastic Neutron Scattering Lab in ISIS-UK – 2006

Duration and activities: The visit to UK was to attend the Inelastic Neutron Scattering (INS) School that was almost a week's course and the visit to the ISIS facility was part of the program. A number of neutron instruments were introduced and a brief experience of the day-to-day work was gained.

2. Visited and worked at Low Temperature Lab in Wroclaw-Poland - 2013

Duration and activities: Two weeks visit to collaborators at Wroclaw, who work in the same field of Strongly Correlated Systems. The lab is equipped with the same instruments (Physical Properties Measuring Systems (PPMS), Magnetic Measurements Measuring Systems (MPMS) as well as many others equipments which included single crystal growth furnaces.

3. Visited and worked at the Synchrotron Lab in Trieste-Italy – 2016

Duration and activities: One-week visit to Trieste in Italy to use Synchrotron facility to characterize one of the ferromagnetic systems (CeCuSi) investigated in highly correlated matter. Structural properties of the compound were investigated as a function of the applied hydrostatic pressure. The compound was subjected under varying hydrostatic pressure, and relaxed after reaching maximum pressure of about 19.6 GPa. The aim was to investigate structural stability under pressure and to establish whether the structure can be recovered after it completely transformed from hexagonal (at ambient pressure) to orthorhombic structure (above 8.6 GPa).

4. Visited and worked at the Bernard Institute in Lyon France – 2016

Duration and activities: 10 days visit to the Bernard Institute in Lyon to use one of their equipment to measure electrical resistivity under applied hydrostatic pressure.

TRAININGS ATTENDED TO DATE

1. 9th Oxford School on Neutron Scattering – Oxford, UK in 2005
 2. Advanced X-Ray Diffraction and Rietveld Refinement Course – RAU in 2005
 3. The use of Synchrotron XPRESS beam line – Italy in 2016
 4. Glass Blowing workshop – UJ in 2019
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CONFERENCES ATTENDED WHERE PRESENTATIONS WERE MADE

1. 47th South African Institute of Physics (SAIP) Annual Conference - Potchefstroom in 2002.
 2. 49th SAIP Annual Conference - Bloemfontein in 2004.
 3. Microscopy Society of Southern Africa (MSSA) Annual Conference - Pretoria in 2004.
 4. 50th SAIP Annual Conference - Pretoria in 2005
 5. 51st SAIP Annual Conference - Western Cape in 2006.
 6. Strongly Correlated Electron System Conference – Houston (USA) in May 2007.
 7. 52nd SAIP Annual Conference – Johannesburg at Wits University in July 2007.
 8. 53rd SAIP Annual Conference –Polokwane at University of Limpopo in July 2008.
 9. Strongly Correlated Electron System Conference – Brazil in August 2008.
 10. 54th SAIP Annual Conference – Durban in July 2009.
 11. International Conference on Magnetism (ICM2009) – Germany in July 2009.
 12. 55th SAIP Annual Conference – CSIR in July 2010.
 13. 56th SAIP Annual Conference – Unisa in July 2011.
 14. 57th SAIP Annual Conference – University of Pretoria in July 2012.
 15. 58th SAIP Annual Conference – Richards Bay in July 2013.
 16. Physics of Magnetism Conference-Poznan in Poland in June 2014.
 17. 59th SAIP Annual Conference – University of Johannesburg in July 2014.
Invited to give talk at SAIP winter school.
 18. 61st SAIP Annual Conference – University of Cape Town in July 2016.
 19. 61st Annual Conference on Magnetism and Magnetic Materials– New Orleans in 2016.
 20. 62nd Annual Conference on Magnetism and Magnetic Materials– Pennsylvania in 2017.
 21. Physics of Magnetism Conference-Poznan in Poland in June 2017.
 22. 62nd SAIP Annual Conference – University of Stellenbosch in July 2017.
 23. Strongly Correlated Electron System Conference – Prague in Czeck Republic, July 2017.
 24. 63rd SAIP Annual Conference – University of Free State in July 2018.
 25. 69th Lindau Nobel Laurette Meeting – Lindau in Germany, June 2019
 26. 64th SAIP Annual Conference – University of Venda in July 2019.
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PUBLICATIONS

JOURNAL PUBLICATIONS PUBLISHED MORE THAN 5 YEARS AGO

1. B M Mhlungu and A M Strydom; Thermal properties and magnetic field effects in ferromagnetic CeAuGe; *Physica B: Condensed Matter*; **403** (2008) 862 – 863.
2. A M Strydom, B M Mhlungu and A Thamizhavel; Field-dependent tuning of the ferromagnetic ordering in CeAgSb₂; *Journal of Magnetism and Magnetic Materials*; **320** (2008) e453 – e456.
3. B M Sondezi-Mhlungu, D T Adroja , A M Strydom , S. Paschen ; Crystal electric field excitations in ferromagnetic CeTX compounds; *Physica B: Condensed Matter*; **404** (2009) 3032 – 3034.
4. B M Sondezi-Mhlungu, D T Adroja, A M Strydom, W Kockelmann and E A Goremychkin; Inelastic neutron scattering and specific heat of CeCuGe; *Journal of Physics: Conference Series*; **200** (2010) 012190.
5. A M Strydom and B M Sondezi-Mhlungu; Magnetic ordering in hexagonal PrCuSi; *Journal of Physics: Conference Series*; **200** 032071.

JOURNAL PUBLICATIONS PUBLISHED WITHIN 5 YEARS

1. A K H Bashir, M B Tchoula Tchokonte, J L Snyman, **B M Sondezi** and A M Strydom, Antiferromagnetic ordering in NdAuGe compound, **115** (2014), *Journ. of Appl. Phys.*, 17E134 - 17E134-3.
2. **B M Sondezi** and A M Strydom; The effect of Ce dilution on the ferromagnetic ordering in CeAuGe, *Acta Polonica A*, **127** (2015), 228 – 230.
3. J C Debnath, A M Strydom, **B M Sondezi**, F. Tappe and R Pöttgen; Magnetic and thermodynamic properties of Ce₄RuAl, *Acta Polonica A*, **127** (2015), 237 – 239.
4. A K Bashir, M B Tchoula Tchokonte, Britz D, **B M Sondezi**, A M Strydom and D Kaczorowski; Electrical and Thermal transport properties of the alloy system (Ce_{1-x}, La_x)Cu₄In; *Journ. of Physics: Conference Series*; **592**, (2015) (1-6), 012004.
6. A K Bashir, M B Tchoula Tchokonte, Britz D, **B M Sondezi**, A M Strydom and D Kaczorowski; Magnetic and thermodynamic properties of GdCu₄In; *Journ. of Physics: Conference Series*; **592** (2015) (1-6), 012050.
7. A. Altayeb, **B. M. Sondezi**, M. B. Tchoula Tchokonté, A. M. Strydom, T. B. Doyle and D. Kaczorowski; Evolution from 4f-electron antiferromagnetic to ferromagnetic order in the CeCuGe_{1-x}Sn_x alloy series (0 ≤ x ≤ 1); *AIP Advances*, **7** issue 5, (2017), 055714.
8. A.K. Bashir^a, M.B. Tchoula Tchokonté^{a,*,}, **B.M. Sondezi**^b, A.M. Strydom^b and D. Kaczorowski^c, *Journ. Alloys and Compds*, **699** (2017), 7-10.
9. MO Ogunbunmi, **BM Sondezi**, HS Nair, AM Strydom, Electronic and magnetic properties of quasi-skutterudite PrCo₂Ga₈ compound, *Physica B: Condensed Matter* **536**, (2018), 128-132.
10. MBT Tchokonté, JJ Mboukam, AKH Bashir, **BM Sondezi**, KR Kumar, Electrical resistivity and thermodynamic properties of the ferromagnet Nd₂Pt₂In, *Journ. Alloys and Compds*. **753**, (2018), 41-45.
11. **BM Sondezi**, AM Strydom, Physical Properties Study of the CeOsGa₄ Compound, *Acta Physica Polonica*, **A. 133** (3), (2018).
12. MBT Tchokonté, JJ Mboukam, **BM Sondezi**, AKH Bashir, D Britz, Critical behavior study around the ferromagnetic phase transition in Pr₂Pt₂In, *Physica B: Condensed Matter* **536**, (2018), 418-421.
13. JJ Mboukam, **BM Sondezi**, MBT Tchokonté, AKH Bashir, AM Strydom, Magnetocaloric effect and other low-temperature properties of Pr₂Pt₂In, *Physica B: Condensed Matter*, **536**, (2018), 505-509.

14. Jean J Mboukam, Moise Bertin Bertin Tchoula Tchokonte, Aiman K Bashir; **Buyisiwe M Sondezi**; Baidyanath N Sahu, Andre M Strydom; Dariusz Kaczorowski, Critical behaviour in Nd₂Pt₂In studied using the magnetocaloric effect: comparison with the conventional method Journal: Accepted for publication in Materials Research Bulletin
15. Jean J Mboukam, Moise Bertin Bertin Tchoula Tchokonte, Aiman K Bashir; **Buyisiwe M Sondezi**; Baidyanath N Sahu, Andre M Strydom; Dariusz Kaczorowski; Large magnetocaloric effect in RE₈Pd₂₄Ga (RE = Gd, Tb and Dy) series compounds, Accepted for publication in Journal of Alloys and Compounds.

PEER REVIEWED CONFERENCE PROCEEDINGS (MEETING DHET REQUIREMENTS FOR SUBSIDY)

1. **B M Sondezi-Mhlungu**, D T Adroja and A M Strydom; Thermodynamic properties and inelastic neutron scattering of ferromagnetic CeCuSi; *56th Annual Conference of South African Institute of Physics Proceedings*; (2011) 319 – 323.
2. **B M Sondezi-Mhlungu** and A M Strydom; Critical behavior near the ferromagnetic Curie phase transition in CeCuGe; *56th Annual Conference of South African Institute of Physics Proceedings*; (2011) 324 – 328.
3. J L Snyman; **B M Sondezi-Mhlungu** and A M Strydom; Magneto caloric effect of ferromagnetic CeAuGe; *56th Annual Conference of South African Institute of Physics Proceedings*; (2011) 314 – 318.
4. **B M Sondezi-Mhlungu** and P Molefe; Is Foundation Provision the solution to first year students' performance? *57th Annual Conference of South African Institute of Physics Proceedings*, (2012), ISBN 978-1-77592-070-0, 452 – 457.
5. P Molefe; **B M Sondezi-Mhlungu**; and Winkler, H; How much do first year physics students really understand? An entry-level test. *57th Annual Conference of South African Institute of Physics Proceedings*, (2012), ISBN 978-1-77592-070-0, 428 – 433.
6. P Molefe and **B M Sondezi-Mhlungu**; Investigating the causes of unsatisfactory performance on the section involving vectors in basic mechanics. *57th Annual Conference of South African Institute of Physics Proceedings*, (2012), ISBN 978-1-77592-070-0, 434 – 439.
7. **B M Sondezi**; J L S Snyman and A M Strydom, The determination of critical behaviour of ferromagnetic CeCuGe using magnetocaloric effect, *58th Annual Conference of South African Institute of Physics Proceedings*, (2013), ISBN 978-0-62062-819-8, 169-174.
8. **B M Sondezi**; T. Nemakhavhani and A M Strydom, The effect of chemical pressure on the ferromagnetic ordering of CeTX compounds, *58th Annual Conference of South African Institute of Physics Proceedings*, ISBN 978-0-62062-819-8, (2013), 163-168.
9. **B M Sondezi** and P Molefe; Is there a gap between the high school curriculum and first year university experience? *58th Annual Conference of South African Institute of Physics Proceedings*, (2013), ISBN: 978-0-620-62819-8, 452 – 457
10. P Molefe and **B M Sondezi**; Physics foundation program: Implications for second year mainstream physics module. *58th Annual Conference of South African Institute of Physics Proceedings*, (2013), ISBN: 978-0-620-62819-8, 446 – 451
11. **B M Sondezi** and Molefe P (2013). Investigation of problem areas in the vectors as experienced by first year university students. *Proceedings of the International Conference of Science, Mathematics and Technology Education held at Kruger Park, 21- 24 October*. 405-413.
12. P Molefe and **B M Sondezi**; Physics foundation program: Can it increase third year physics major enrolment? International Multi-conference on Education, Law, Environment and Metallurgical Engineering (IMELEME'2013) Nov. 27-28, (2013) Johannesburg (South Africa)

13. **B M Sondezi** and P Molefe; Investigation of problem areas in the vectors as experienced by first year university students. *Proceedings of the International Conference of Science, Mathematics and Technology Education held at Kruger Park, 21 - 24 October.* (2013), UNISA Press, 405-413.
14. P Molefe and **B M Sondezi**; A four-year foundation degree programme. Do we need it? 6th International Conference on Economics, Humanities, Bio-Technology & Environment Engineering (ICEHBEE'2014) Nov. 27-28, (2014) Cape Town (South Africa)
15. **B M Sondezi**; and P Molefe; The experiences of four year programme degree student's. 6th International Conference on Economics, Humanities, Bio-Technology & Environment Engineering (ICEHBEE'2014) Nov. 27-28, (2014) Cape Town (South Africa).
16. G R Hearne; G Diguët, A M Strydom, **B M Sondezi**, K Kamenev, Faudelet , L Nataf, Pressure effects on the magnetic-electronic behavior of the local moment ferromagnet CeCuSi; *59th Annual Conference of South African Institute of Physics Proceedings*; ISBN: 978-0-620-65391-6, (2014), 41 – 46.
17. Sindisiwe P. XHAKAZA, Harikrishnan S. Nair, **Buyisiwe M. Sondezi**, Douglas BRITZ, Andre M. STRYDOM, Thermal and electrical transport properties of Sm₃Rh₄Ge₁₃ compound, South African Institute of Physics (SAIP) 2018, ISBN 978-0620-82077-6, Page 306 – 310.

SUBMITTED FOR 2019 CONFERENCE(S), BOTH SCIENCE EDUCATION AND CONDENSED MATTER PHYSICS

1. P Molefe and **BM Sondezi**, A re-look at the sequencing of concepts in our curriculum.
2. **BM Sondezi** and P Molefe, Are we giving our students more than we should? (SAIP 2019).
3. PM Mabidi, **BM Sondezi**, BN Sahu and AM Strydom, Magnetic and thermodynamic properties of the CeRhGa₄ compound, SAIP 2019.
4. MO Ogunbunmi, **BM Sondezi**, and AM Strydom, Crystal Electric Field Effects and Heavy-Fermion-Like Behavior of Cubic PrCu₂Au₃ Compound, ACCEPTED for SCES2019 Conference.
5. JJ Mboukam, MB Tchoula Tchokonté, **BM Sondezi**, A.K.H. Bashir, B. Sahu, AM Strydom, D. Kaczorowski, Physical and Magnetocaloric properties of Ho₂Pt₂In, ACCEPTED for SCES2019 Conference.

LATEST PUBLICATIONS

IN EDUCATION DISCIPLINE

1. **BM Sondezi** and P Molefe, Exposure As a Tool to Increase Student Numbers of Postgraduate Physics Students
2. P Molefe and **BM Sondezi**, I Taught them Every Basic, but they Still Couldn't Get It Right
3. **BM Sondezi** and P Molefe; Postgraduate studies: What influences students' choices in research?
4. **B.M. Sondezi**, How do undergraduate students respond to early research?
5. P. Molefe and **B.M Sondezi**, Students' presentations as a teaching and learning tool
6. P. Molefe and **B.M. Sondezi**, Vectors, from the students' point of view.

STUDENTS SUPERVISION

1. Phd Students = 1 at the final stage and 1 at the beginning stage.
2. MSc Students = 3 (2, Graduated and 1 currently busy)
3. BSc Honours Students = 4 (Graduated)

LEADERSHIP QUALITIES AND PROJECTS

1. President of Science Students Council in 2001 at Vista University
2. A Pastor of Dr Buyi Sondezi Ministries (BSM) International and Rivers of Life International Ministries (ROLIM).
3. Current President of Women in Physics in South Africa (WiPiSA)
4. SAIP Council member, holding Marketing Portfolio, elected in July 2017.
5. School Governing Body Chairperson of HoërSkool Roodepoort (HSR), from 2017 to date.
6. Community Engagement Portfolio at UJ.
7. STEM Students' Mentorship at UJ.
8. Running Saturday School Classes at HSR.
9. Running a Soup Kitchen Project at Roodepoort Community Center.
10. Facilitator of DrBSondezi Fitness Club.
11. Founder and facilitator of DrBS King-Joy Netball Club.
12. Founder of Dr Buyi Sondezi STEM-BRIDGE Foundation.

SCIENCE OUTREACH PROJECTS

1. Ipi Ntombi Project – to motivate and encourage girls to do science.
2. Science Week Projects – teaching and demonstrating experiments to school learners – Necsa.
3. WiPiSA Project - to motivate and encourage girls to do science.
4. School visits helping grade 12 learners prepare for exams.
5. Conference organizing for learners and students to encourage them to do Physics and Science related subjects and careers.
6. Organizer of Annual Learners Science Conference held at UJ.

AWARDS

1. Most Outstanding Oral Presentation in the field of Condensed Mater Physics and Material Science delivered at Annual SAIP Conference by a Masters Student – 2004.
 2. Most Outstanding Poster Presentation in the field of Condensed Mater Physics and Material Science delivered at Annual SAIP Conference by a PhD Student – 2008.
 3. Women in Science Awards-awarded by Department of Science and Technology – 2009.
 4. South African National Research Fund (NRF) grant – 2011 and 2012.
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INTERESTS

Singing, reading and spending time with family.

REFEREES

Prof H Winkler

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Role	Professor of Physics
Relationship to the referee,	My Undergraduate Lecturer and a Mentor
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Prof A M Strydom

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Apostle P Dungulu

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Signature: _____