KAMOHELO G. TSHABALALA, Ph.D.
Senior Lecturer

Work address

Physics Department
University of the Free State Qwa-Qwa
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Current research interests

- Down-conversion nanophosphors for solar cells, biological and security applications
- Collaborative broad-based Internet of things compliant telemetry system

Additional research interests

- Perovskite to optimize photovoltaic performance
- GSM base data telemetry system

Education

Free State University, Bloemfontein, SA

Ph. D. in Physics, 2014

Ph. D Thesis Title: "*Synthesis and characterization of down-conversion nanophosphors*"

Advisors: Profs OM Ntwaeaborwa and HC Swart, Physics Department

Western Cape University, Bellville, SA

MSc. in Physics, 2007

MSc. Dissertation Title: "*Electrical resistivity of the Kondo systems* $(Ce1_{-x}Re_x)In_3$, *Re= Gd, Tb, Dy and* $Ce(Pt_{1-x}Ni_x)Si_2$"

Advisors: Profs MB Tchoula Tchokonte (UWC) and P du Plessis (UJ)

Work experience

2017 to 2020: Subject Head at Physics Department Qwa-Qwa Campus

2014 – 2016: Subject Head at Physics Department Qwa-Qwa Campus

2012 to Date: Full time Physics Senior Lecturer

Undergraduate

- Responsible for Statistical Physics I and II (PHYS3732 & PHYS3742) in 3rd year both first and second semester

- Responsible for Practical modules (PHYS3752 & PHYS3762) as well in 3rd year both first and second semester
- Responsible for Physics in Biological Sciences (PHYS1534 & PHYS1644) in 1st year

Postgraduate

- Responsible for Material Science I and II (PHYI6834 & PHYI6864) in Honors
- Responsible for Research project module (PHYS6808) in Honors
- Responsible for student supervision

Summary of Research Experience

Co-promoter

SJ Motloung – PhD in Physics completed 2017

"*Investigation of photoluminescent properties of rare-earths doped mixed multicomponent structures of phosphovanadates*"

MA Lephoto – PhD in Physics completed 2017

"*Synthesis and characterization of rare-earth doped borates phosphors for application in solid state lighting*"

Promoter

TD Malevu – PhD in Physics completed 2018

"*The fabrication of low-cost perovskite-based solar cells that use recycled lead and lead compounds from depleted sealed-lead acid (SLA) batteries*"

External examiner

- **2020** – PhD **THESIS, Olakunle Oluwaleye (UNISA):** *"Ion beam modification of transparent conducting oxide (TCO) thin films by keV ions"*
- **2020** - MSc dissertation, **Ms MN Mphelane (SMU):** "*Sol-gel synthesis and Characterization of structural and luminescence properties of* $Zn_{0.5}Ca_{0.5}Al_2O_4$ *nanophosphor activated with* Eu^{3+}, Cr^{3+} *and* Pb^{3+}".
- **2019** – PhD **THESIS, Mrs MR Mhlongo (SMU):** *"Synthesis and Characterization of mixed phases of* $SrAl_2O_4/Sr_3Al_2O_4/ZnAl_2O_4/ZnO$ *activated with foreign ions using sol-get and Chemical Bath deposition methods"*
- **2019** – MSc **DISSERTATION, Ms G Mashao (UL):** *"Electrospun Polyaniline-Zeolitic Imidazolate Framework Composite Nanofibers for Hydrogen Gas Sensing Application"*
- **2018** - MSc nanoscience dissertation, **Letswalo MLA (UJ):** "*Effect of anionic partial substitution on structural and luminescence properties of* $CaMoO_4$*:* Eu^{3+} *color tunable Phosphor compounds for White-Light-Emitting Diode Applications*".
- **2018** - MSc dissertation, **Maphiri VM (SMU):** "*Synthesis and characterization of* $Mg_xAl_2O_{3+x}$ *activated and co-activated with foreign ions*".

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Internal examiner

- **2019** – PhD **THESIS, Mr DD Hile (UFS):** *"Synthesis and Characterization of Zinc selenide nanostructured thin films for applications in light emitting materials"*
- **2019** – PhD **THESIS, Mr H Mergesa (UFS):** *"Synthesis, Growth and Characterization of undoped and Cr^{3+} doped ZnM_2O_4(M=Ga,Al) spinels nano structures by sol-gel method for bio imaging application"*
- **2019** – PhD **THESIS, Mr AG Habte (UFS):** *"Characterization of undoped and doped tin dioxide nanostructured and chemically deposited cadmium selenide thin film"*

Publications ORCID iD http://orcid.org/0000-0002-0919-8805

Journal of Electronic Materials
Volume 48, **2019**, Pages 6954-6963 DOI: 10.1007/s11664-019-07490-2

Effect of Ni Doping on ZnO Nanorods Synthesized Using a Low- Temperature Chemical Bath

Malevu T.D.[a],*, Mwankemwa B.S.[b], Ahmed, M.A.M[c] ,Motaung, T.E.[d], **Tshabalala, K.G.**[e], Ocaya, R.O.[e]

[a]Department of Chemistry and Physics, Westville Campus, University of KwaZulu-Natal, Private Bag X54001, Durban 4000, South Africa
[b]Department of Physics, School of Physical Sciences, College of Natural and Mathematical Sciences, University of Dodoma, P.O. Box 338, Dodoma, Tanzania
[c]Department of Physics, Faculty of Education, University of Khartoum, P.O. Box 321, Omdurman, 11115, Sudan
[d]Department of Chemistry, University of Zululand, KwaDlangezwa Campus, Private Bag X1001, KwaDlangezwa, 3886, South Africa

[e]Department of Physics, University of the Free State(Qwaqwa Campus), Private Bag X13, Phuthaditjhaba, 9866, South Africa

Physica E: Low-dimensional Systems and Nanostructures (8 Citations)
Volume 106, **2019**, Pages 127-132, DOI: 10.1016/j.physe.2018.10.028

Effect of annealing temperature on nano-crystalline TiO_2 for solar cell applications

T.D. Malevu[a],*, B.S. Mwankemwa[c,b], S.V. Motloung[d], **K.G. Tshabalala**[e], R.O. Ocaya[e]

[a]Department of Chemistry and Physics, Westville Campus, University of KwaZulu-Natal, Private Bag X54001, Durban 4000, South Africa
[b]Department of Physics, University of Pretoria, Pretoria, 0002, South Africa
[c]Department of Physics, School of Physical Sciences, College of Natural and Mathematical Sciences, University of Dodoma, P.O. Box 338, Dodoma, Tanzania
[d]Department of Physics, Nelson Mandela University, P. O. Box 77000, Port Elizabeth 6031, South Africa
[e]Department of Physics, University of the Free State(Qwaqwa Campus), Private Bag X13, Phuthaditjhaba, 9866, South Africa

Journal of Molecular Structure (9 Citations)
Volume 1175, **2019**, Pages 241-252, DOI: 10.1016/j.molstruc.2018.08.002

Effect of Tb^{3+} concentration on the structure and optical properties of triply doped $ZnAl_2O_4$:1% Ce^{3+},1% Eu^{3+},x% Tb^{3+} nano-phosphors synthesized via citrate sol-gel method

S.V. Motloung[1], **K.G. Tshabalala**[2], R.E. Kroon[3] , T.T. Hlatswayo[4] ,M. Mlabao[4] ,S. Mpelane[5]

[1]Department of Physics, Nelson Mandela University, P. O. Box 77000, Port Elizabeth 6031, South Africa
[2]Department of Physics, University of the Free State(Qwaqwa Campus), Private Bag X13, Phuthaditjhaba, 9866, South Africa
[3]Department of Physics, University of the Free State, P.O. Box 339, Bloemfontein, 9300, South Africa
[4]Department of Physics, University of Pretoria, Pretoria, 0002, South Africa
[5]Department of Chemistry, University of Johannesburg, P.O. Box: 524, Auckland Park, 2006, South Africa

Journal of Materials Science: Materials in Electronics (1 Citation)
June 2018, DOI: 10.1007/s10854-018-9422-4

Synthesis and characterization of high-quality PbI_2 nanopowders from depleted SLA accumulator anode and cathode

T.D. Malevu[1], B. S. Mwankemwa , **K.G. Tshabalala**[1], M. Diale[2] R.O. Ocaya[1]

[1]*Department of Physics, University of the Free State Qwa-Qwa Campus, Phuthaditjhaba, ZA 9866, South Africa*
[2]School of Pharmacy and Life Sciences, Robert Gordon University, Garthdee Road, Aberdeen AB10, UK

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Journal of Luminescence (4 Citations)
Volume 200, August **2018**, Pages 94-102 DOI: 10.1016/j.jlumin.2018.04.014

Photoluminescence studies of green emitting BaB_8O_{13}: Bi^{3+} phosphors prepared by solution combustion method
Lephoto M.A.[1], **Tshabalala K.G.**[1], Motloung S.J. [1], Mhlongo G.H.[2], Ntwaeaborwa O.M[3]
[1]Department of Physics, University of the Free State, Phuthaditjhaba, South Africa
[2]DST/CSIR National Centre for Nanostructured Materials, Council for Scientific and Industrial Research, Pretoria, South Africa
[3]School of Physics, University of the Witwatersrand, Wits, South Africa

Physica B: Condensed Matter (3 Citations)
Volume 535, 15 April **2018**, Pages 211-215 DOI:10.1016/j.physb.2017.07.038

Combustion synthesis and characterization of $MV_{0.5}P_{0.5}O_4$: Sm^{3+} Tm^{3+} (M = Gd, La, Y)
Motloung S.J[1], Lephoto M.A.[1], **Tshabalala K.G**. [1], Ntwaeaborwa O.M.[3]
[1]Department of Physics, University of the Free State, Phuthaditjhaba, South Africa
[3]School of Physics, University of the Witwatersrand, Wits, South Africa

Physica B: Condensed Matter
Volume 535, 15 April **2018**, Pages 89-95 DOI:10.1016/j.physb.2017.06.063

Study on photoluminescence and energy transfer of Eu^{3+}/Sm^{3+} single-doped and co-doped BaB_8O_{13} phosphors
Lephoto M.A.[1], **Tshabalala K.G.**[1], Motloung S.J. [1], Ahemen I[2], O. M. Ntwaeaborwa[3]
[1]Department of Physics, University of the Free State, Phuthaditjhaba, South Africa
[2]Department of Physics, University of Agriculture, Makurdi, Nigeria
[3]School of Physics, University of the Witwatersrand, Wits, South Africa

LUMINESCENCE: The Journal of Biological and Chemical Luminescence (5 Citations)
17 January **2017**, Pages 1-8 I DOI 10.1002/bio.3295

Tunable emission from LiBaBO3:Eu^{3+};Bi^{3+} phosphor for solid-state lighting
M. A. Lephoto[1], **K. G. Tshabalala**[1], S. J. Motloung[1], S. K. K. Shaat[2], O. M. Ntwaeaborwa[3]
[1]Department of Physics, University of the Free State, Phuthaditjhaba, South Africa
[2]Department of Physics, Islamic University, Gaza, Palestine
[3]School of Physics, University of the Witwatersrand, Wits, South Africa

Advanced Materials Letters
Online Publication Date, 21 Nov **2016** In Press DOI: 10.5185/amlett.2016.1405

Combustion synthesis and characterization of Sm^{3+} and Tm^{3+} co-activated yttrium orthovanadate phosphate
Selepe Joel Motloung[1], **Kamohelo George Tshabalala**[1], Odireleng Martin Ntwaeaborwa[2]
[1]*Department of Physics, University of the Free State Qwa-Qwa Campus, Phuthaditjhaba, ZA 9866, South Africa*
[2]School of Physics, University of the Witwatersrand, Private Bag x 3, Wits, 2050, South Africa

Physica B: Condensed Matter (5 Citations)
Volume 496, 01 September **2016**, Pages 69-73

Phase transformations of high-purity PbI_2 nanoparticles synthesized from lead-acid accumulator anodes
TD Malevu[1], RO Ocaya[1], **KG Tshabalala**[1]
[1]*Department of Physics, University of the Free State Qwa-Qwa Campus, Phuthaditjhaba, ZA 9866, South Africa*

Applied Physics A (2 Citations)
Volume 122, Issue 7, 01 July **2016**, Pages 1-7

Synthesis and characterization of high-quality PbI_2 nanopowders from depleted SLA accumulator anode and cathode
TD Malevu[1], RO Ocaya[1], **KG Tshabalala**[1], C Fernandez[2]
[1]*Department of Physics, University of the Free State Qwa-Qwa Campus, Phuthaditjhaba, ZA 9866, South Africa*
[2]School of Pharmacy and Life Sciences, Robert Gordon University, Garthdee Road, Aberdeen AB10, UK

KAMOHELO G. TSHABALALA, Ph.D.
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LUMINESCENCE: The Journal of Biological and Chemical Luminescence (3 Citations)
Volume 31, 7 January **2016**, Pages 1069-1076

Structure and photoluminescent properties of green-emitting terbium-doped $GdV_{1-x}P_xO_4$ phosphor prepared by solution combustion method

S. J. Motloung[1,*], S. K. K. Shaat[2], **K. G. Tshabalala**[1] and O. M. Ntwaeaborwa[3,*]

[1]*Department of Physics, University of the Free State Qwa-Qwa Campus, Phuthaditjhaba, ZA 9866, South Africa*
[2]Department of Physics, Islamic University, Gaza Strip, Palestine
[3]*Department of Physics, University of the Free State, Bloemfontein, ZA 9300, South Africa*

ENTECH'15: III. International Energy Technologies Conference Proceedings
ISBN: 978-605-9207-20-1, December **2015**, Pages 159-166

Effect of post-melt annealing on phase transformation in high-purity PBI_2 nanoparticles from lead-acid accumulator anodes

Thembinkosi Malevu[a], Richard Ocaya [a], **Kamohelo Tshabalala** [a]
[a]*Department of Physics, University of the Free State Qwa-Qwa Campus, Phuthaditjhaba, ZA 9866, South Africa*

Physica B: Condensed Matter (10 Citations)
Volume 407, Issue 10, 15 May **2012**, Pages 1489-1492

Luminescence properties of Ce^{3+} and Tb^{3+} co-activated $ZnAl_2O_4$ phosphor

K.G. Tshabalala[a], S.-H. Cho [b], J.-K. Park [b], Shreyas S. Pitale[a], I.M. Nagpure[a], R.E. Kroon[a], H.C. Swart [a], O.M. Ntwaeaborwa[a]
[a]*Department of Physics, University of the Free State, Bloemfontein, ZA 9300, South Africa*
[b]*Nano-Materials Center, Korea Institute of Science and Technology, Cheongryang 39-1 Hawolkok, Seoul 130-650, South Korea*

Journal of Vacuum Science & Technology B (16 Citations)
Volume 30, Issue 3, March **2012**, 6 Pages 031041

Enhanced green emission from UV down-converting Ce^{3+}–Tb^{3+} co-activated $ZnAl_2O_4$ phosphor

K. G. Tshabalala[1], I. M. Nagpure[1], H. C. Swart[1], O. M. Ntwaeaborwa[1], S.-H. Cho[2], and J.-K. Park[2]
[1]*Department of Physics, University of the Free State, P. O. Box 339, Bloemfontein, ZA 9300, South Africa*
[2]*Nano Materials Center, Korea Institute of Science and Technology, Cheongryang 39-1 Hawolkok, Seoul 136-791, South Korea*

Materials Research Bulletin (5 Citation)
Volume 46, Issue 12, December **2011**, Pages 2359-2366

Luminescence response and CL degradation of combustion synthesized spherical SiO_2:Ce nanophosphor

I.M. Nagpure , Shreyas S. Pitale, **K.G. Tshabalala**, Vinay Kumar, O.M. Ntwaeaborwa, J.J. Terblans, H.C. Swart
Department of Physics, University of the Free State, P. O. Box 339, Bloemfontein ZA9300, South Africa

Journal of Alloys and Compounds (50 Citations)
Volume 509, Issue 41, October **2011**, Pages 10115-10120

Luminescent properties and X-ray photoelectron spectroscopy study of $ZnAl_2O_4$:Ce^{3+},Tb^{3+} phosphor

K.G. Tshabalala[a], S.-H. Cho [b], J.-K. Park [b], Shreyas S. Pitale[a], I.M. Nagpure[a], R.E. Kroon[a], H.C. Swart [a], O.M. Ntwaeaborwa[a]
[a]*Department of Physics, University of the Free State, Bloemfontein, ZA 9300, South Africa*
[b]*Nano-Materials Center, Korea Institute of Science and Technology, Cheongryang 39-1 Hawolkok, Seoul 130-650, South Korea*

KAMOHELO G. TSHABALALA, Ph.D.
Senior Lecturer

Journal of Physics and Chemistry of Solids
Volume 71, Issue 3, March **2010**, Pages 181-186

Magnetic substitution in $CeIn_3$

Moise Bertin Tchoula Tchokonté[a], **Kamohelo George Tshabalala** [a], Paul de Villers du Plessis[b,c] and Dariusz Kaczoroski [d]
[a]*Department of Physics, University of the Western Cape, Private Bag X 17, Bellville 7535, South Africa*
[b]*Department of Physics, University of Johannesburg, PO Box 524, Auckland Park 2006, South Korea*
[c]*School of Physics, University of Witwatersrand, Private Bag 3, PO Wits 2050, Johannesburg, South Korea*
[d]*Institute of Low Temperature and Structured Research, Polish Academy of Sciences, PO Box 1410, 50–950, WrocLaw Poland*

Rewards and recognitions

- 2018: Best Emerging Researcher Award in Natural Agricultural Sciences Faculty
- 2018: European Advanced Energy Materials Congress SWEDEN, certificate of attendance
- 2017: Certificate of Reviewing, Physica B: Physics of Condensed Matter
- 2016: Awarded a Thuthuka Funding for post PhD from National Research Foundation (NRF)
- 2011: Awarded Certificate of an excellent paper award at 4th Material Research Society of Korea International Conference, Jeju Island, South Korea.
- 2007: Awarded Certificate of Participation the EDWARD BOUCHET-ABDUS SALAM Institute (EBASI) International Conference -6 at iThemba LABS Cape Town.
- 2005: Awarded a bursary from National Research Foundation (NRF).

Academic and Professional members

- South African Institute of Physics (SAIP)
- Professional Physicist (Pr. Phys)
- Committee member: 63rd Annual conference of the South African Institute of Physics
- Judge Student Affairs Annual Awards 2019 Bloemfontein

Google Scholar H-Index 7, Citations 172 and i10-index 5

Scopus H-Index 7

References Available On Request