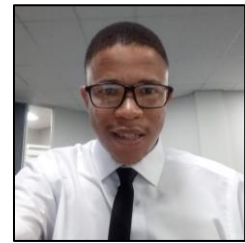# Lesetja Ephraim Lekoloane

Address:
21 Hill Village
356 Hill Street
Arcadia, Pretoria, 0007, South Africa

Contacts:
+27 (0) 74 455 0846
lekoloanelesetja@gmail.com
https://leeseetja.github.io

SUMMARY

An atmospheric scientist who is fascinated by high-performance computing, numerical modelling, and has a strong passion for research. My career interests are particularly in research, numerical modelling, and applying data science techniques to atmospheric Physics.

SKILLS

Technical

Object-oriented programming and procedural programming • Structured and Modular programming • Programming languages: Linux Shell/Bash scripting, Python, JavaScript, FORTRAN, MATLAB, R, HTML, CSS, PHP, MySQL, and GrADS • Version control system using Git and GitHub • Objective data quality control • Remote data retrieval and analysis • Scientific research methodology • Good communication of scientific concepts in both written and verbal forms • Computational research • Statistical and numerical analysis • High-performance computing • Setup, configure and run numerical models • Geographic Information System and Remote Sensing techniques • Geospatial analysis • Front and back end web development.

Personal

Problem-solving and decision-making • Conflict resolution and mediation • Works well in a team and individually • Emotional intelligence • Leadership and organisational skills • Strategic thinking • Diligence • Personal drive and initiative • Team player • Willingness to learn • Ability to work under pressure and meet deadlines • Flexible.

WORK EXPERIENCE

Research Scientist at the South African Weather Service (August 2020 – present)

My work is with the model development group, focusing on numerical weather prediction and climate modelling.

- Numerical models of focus include the Unified Model (UM), Conformal Cubic Atmospheric Model (CCAM) and the Weather Research and Forecasting model (WRF).
- Research also includes weather and climate dynamics analysis.

Research intern at the South African Weather Service (August 2018 – July 2020)

Research/Roles under the model development group.

- Retrieved, quality-controlled, and analysed Radar, Satellite, and Automatic Weather Station datasets in various formats.
- Setup, configure, and run numerical models: Weather Research and Forecasting (WRF) model and the Unified Model (UM).
- Performed a dynamic and thermodynamic analysis of high impact weather events captured by high-resolution models run at the South African Weather Service.
- Examined the parameterisation of the planetary boundary layer in numerical models.

- Assisted a senior scientist to debug and fix a program developed for weather forecasters at the South African Weather Service (SAWS).
- Improved my programming skills, including machine learning and data analytics.
- Wrote code and algorithms in Shell/Bash scripting, Python, FORTRAN, and GrADS languages for computations and advanced data analysis.
- Worked on High-Performance Computers hosted at the Centre for High Performance Computing (CHPC) and the SAWS.

EDUCATION
University of the Witwatersrand
2019 - present
Master of Science (Earth System Science)
- Research project: Evaluating the ability of atmospheric models in simulating boundary layers in the Southern Hemisphere.

University of Pretoria
2017 - 2018
Bachelor of Science (Honours) (Meteorology)
- I had the privilege of doing my research project (titled: Evaluation of the planetary boundary layer mixing height in South Africa) with the now late Professor George Djolov, an internationally recognised research scientist in the field of Physics. He supervised my research where I performed a statistical analysis of numerical model output. I managed to obtain a *cum laude* pass for this project and had it peer-reviewed for a conference's publication and oral presentation.

2012 - 2017
BSc Meteorology
- Modules in: Meteorology, Physics, Applied Mathematics, Geometrical and Space Geodesy, Advanced Remote Sensing Techniques, Geographic Data Analysis, and Programming.

Thuto Ke Maatla Comprehensive School
2007 - 2011
Grade 12 / Matric:
- Distinctions in Mathematics, Physical Sciences, and Life Orientation. Total average: 76%.

Other Specialised Training
2020
University of Cape Town: Discretisation methods and numerical data analysis
- Discretisation and numerical modelling using the finite element method and finite volume method.
- Numerical model data analysis using MATLAB.

2019
SAWS: Machine Learning and data analytics short course
- Machine Learning (ML) introduction, concepts, classification vs. regression, types of learning, classical and newer methods, over-fitting, and under-fitting.
- Data understanding, visualisation, and preparation.

- Linear regression and logistic regression as preparation for neural networks.
- Bayesian learning, and discriminant analysis for classification.
- Artificial Neural Networks (ANN) for classification and regression.
- Deep learning and Time series analysis using ANN.

2018
<u>SAWS</u>: Android mobile applications development training using Android Studio
- Introduction to Android application development, including the application programming interface (API).

LEADERSHIP DEVELOPMENT
- Co-founder and Director: Chef and Guests (Pty) Ltd (2018 – present): www.chefnguests.co.za
- Executive committee member: Thinkbig39 (NPO) (2013 – 2018): www.thinkbig39.co.za

PEER-REVIEWED PUBLICATIONS
- Lekoloane, L.E., Bopape, M.M., Rambuwani, T.G, Ndarana, T., Landman, S., Mofokeng, P., Gijben, M., and Mohale, N.: A dynamic and thermodynamic analysis of the 11 December 2017 tornadic supercell in the Highveld of South Africa, Weather and Climate Dynamics, 2, 373 – 393, 2021. Doi: https://doi.org/10.5194/wcd-2-373-2021.
- Lekoloane, L.E., Bopape, M.M., and Rambuwani, T.G., 2019: Investigating the role of near-surface atmospheric boundary layer moisture flux in supercellular tornadogenesis over Gauteng during December 2017, *Proceedings of the 35th Annual conference of South African Society for Atmospheric Sciences*, 8 - 9 October 2019, Vanderbijlpark, South Africa.
- Lekoloane, L.E., and Djolov, G., 2017: Evaluation of the planetary boundary layer mixing height in South Africa, *Proceedings of the 33rd Annual conference of South African Society for Atmospheric Sciences*, 21 - 22 September 2017, Polokwane, South Africa.

CONFERENCES AND PRESENTATIONS
- Oral presentation at the 35th Annual Conference of the South African Society for Atmospheric Sciences in Vanderbijlpark in 2019: "Investigating the role of near-surface atmospheric boundary layer moisture flux in supercellular tornadogenesis over Gauteng during December 2017".
- Oral presentation at the 33rd Annual Conference of the South African Society for Atmospheric Sciences in Polokwane in 2017: "Evaluation of the planetary boundary layer mixing height in South Africa".

PROFESSIONAL ASSOCIATIONS
- South African Society for Atmospheric Sciences (2017 – present)

REFERENCES

Dr Thando Ndarana
Senior Lecturer
University of Pretoria
thando.ndarana@up.ac.za
012 420 5164

Prof Francois Engelbrecht
Professor
University of the Witwatersrand
Francois.Engelbrecht@wits.ac.za
011 717 6098

Dr Mary-Jane Bopape
Senior Manager
South African Weather Service
mary-jane.bopape@weathersa.co.za
012 367 6015

Dr Hamilton Genesan
Bioinformatics Manager
Inqaba Biotec
hamilton.ganesan@inqababiotec.co.za
072 713 5356