

RESEARCH NEWSLETTER



NATIONAL UNIVERSITY OF
SCIENCE AND TECHNOLOGY

RESEARCH AND INTERNATIONALISATION OFFICE

JULY 2022

Harnessing geothermal energy from hot springs



- Research opportunities
- Upcoming events

CALL FOR PAPERS

Researchers are invited to submit papers for publication in the Southern African Journal of Communication and Information Science (SAJCIS) which is a peer reviewed journal that is hosted by the National University of Science and Technology (NUST). SAJCIS welcomes papers from all areas of research in communication and information science.

MANUSCRIPT SUBMISSION

Manuscript submitted for publication must be written in conformity to the format for submission provided on the official SAJCIS site <https://www.nust.ac.zw/sajcis/>

Please read Instructions for Authors before submitting your manuscript. All manuscripts should be submitted as an email attachment and sent to sajcis@nust.ac.zw

SUBSCRIPTION

Currently, SAJCIS is a free online Journal hosted by the NUST website, hence there are no hard copy versions of the journal.

*SAJCIS Editor: Prof. P. Dewah and Dr. S. Mpofu
National University of Science and Technology
P. O. Box AC939, Ascot, Bulawayo, Zimbabwe*



**CALL
FOR PAPERS**

Editor's note



Sharing results makes us better researchers

As scientists, we should not conduct research to just satisfy our own curiosity but, we must aim to benefit society at large by raising public awareness and creating innovations that enhance development. For research to serve its full purpose, the results must leave the confines of research laboratories and academic journals.

We are excited to announce that the monthly NUST Research and Internationalisation Office (RIO) newsletter is back to do just that. We have taken time to rethink, redesign and refocus our newsletter.

In our acceleration of the Heritage-based Education 5.0, which seeks to take research from our STEM laboratories to bring about innovative solutions to communities and drive the country's commercialisation and industrialization, we aim to disseminate scientific knowledge that is void of technical jargon so that we do not leave anyone behind. This is a great task, but one that I believe is possible to achieve.

NUST continues to break new ground in research. Our multi-disciplinary research groups are helping the University to achieve its vision of being a world class University in science, technology, innovation, entrepreneurship and business development, spearheading

industrialisation locally and beyond.

In this issue, our feature article shares insights of the Geophysics Research Group where Professor Dumisani John Hlatywayo and his team are investigating the potentials of geothermal energy in Zimbabwe's hot springs. Their focus is to harness locally available materials for the benefit of the communities. Speak of the Heritage-based Education 5.0.

We also take the opportunity to introduce the RIO team. Sit back and enjoy reading the July edition of the research newsletter. We look forward to your feedback and contributions. Remember, sharing results of our research with the people who are most affected by them makes us better researchers and ensures that our work can be used to improve people's lives.

Dr Thembekile Ncube

Director for Research and Internationalisation Office.

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Harnessing geothermal energy at Zim's hot springs

By Israel Mbekezeli Dabengwa

A GEOPHYSICS Research Group in the Department of Applied Physics at NUST is investigating the potential of harnessing geothermal energy from Zimbabwe's hot springs, a breakthrough that will alleviate the country's energy deficit and improve the people's lives.

A hot spring is a spring that is produced when geothermally heated groundwater emerges from the Earth's crust.

The country has over 30 hot springs, with the hottest in Binga, on the shores of Lake Kariba, Lubimbi near the Gwayi River and Rupisi between Nyanyadzi and Chiyadzwa diamond fields.

The research group is led by Professor Dumisani John Hlatywayo as the principal investigator and Mr Mervyn Gumbo, the co-investigator. Other team members include: Mr. Constant Chuma, Mr. Robin Mashingaidze, Ms. Olivia Chitake, Ms. Luba Thwala Mr. Thabisani Ndlovu, Mr. Hebert Manuale and Mr. Prince Sigwegwe.

The research group, which has been operational since 2012, is keen on finding ways of harnessing geothermal energy from hot springs. Geothermal energy is a renewable energy source, which is continuously produced inside the earth and can be used to generate electricity.

In Zambia, the Kalahari GeoEnergy company is evaluating the feasibility of setting up a geothermal plant at the Bweengwa



River, west of the capital Lusaka.

Kenya was the first African country to build geothermal energy sources and as of 2019 they had 690 megawatts of installed geothermal capacity.

The geothermal energy research by NUST comes at a time the country is exploring alternate energy sources under the country's National Development Strategy 1 (NDS 1) framework.

With support from the International Science Programme based at Uppsala University in Sweden, the Government of Zimbabwe and the local communities, the research group has covered a lot of ground. Using traditional geophysics methods, the team seeks to establish the sources of geothermal energy and then recommend the Ministry of Energy and Power Development



to carry out a feasibility study.

If successful, a geothermal plant would be set up to reduce Zimbabwe's energy deficit and improve the lives of the local communities as envisaged by the Vision 2030, which aims to develop the country into a prosperous middle-income economy by the year 2030.

The research is in line with the Sustainable Development Goal 7, which calls for "affordable, reliable, sustainable and modern energy for all" by 2030.

The NUST research team is currently exploring the geology of the area, fractures and faults, with a view of establishing whether there is a heat reservoir underneath.

While the knowledge from the research cannot be patented, it will lead to publication of results that will inform future investigations.

The Geophysics Research Group has previously investigated the quantity and levels of contamination of underground water sources in Bulawayo and Matabeleland provinces.

Plans are in place to grow the research group into a research institute, which can investigate and intervene on water problems across Africa and the rest of the world and establish a magnetic observatory in our country.

Field pictures from the Geophysics team in Binga, June 2022.



Q&A

Insights into Geophysics Research Group's projects

The leader of the Geophysics Research Group, Professor Dumisani John Hlatywayo, shares more insights on geothermal energy and underground water investigations undertaken by the group.

Q: What are your current major research projects?

A: We are investigating underground water sources in the Bulawayo Metropolitan as well as understanding the nature of the water-bearing rock that forms the aquifer beneath the City of Bulawayo. We are also conducting a project on the potentials around Binga (Chibwatata Hot Springs), Nyanyadzi Hot Springs and Rupisi Hot Springs. This will give an inference for Geothermal Energy potential for Zimbabwe with indications for the possibilities of electricity generation from Geothermal plants in Zimbabwe.

Q: What problems are you trying to address?

A: Its twofold. Firstly, shortages of water in the Bulawayo Metropolitan due to droughts and inadequate water reticulation resulting from population increase and industrial expansion over the years with no matching expansion in the water sources and reticulation. Secondly, shortages in electric power generated from existing Power Plants and a desire to see Zimbabwe move over from fossil based power generation to clean energy.

Q: Why is the research significant?

A: The first research activity on groundwater in the Bulawayo Metropolitan will inform both the Bulawayo City Council and Zimbabwe National Water Authority (ZINWA) in planning for sustainable water resource and supplementing surface water with underground water. The second activity on geothermal energy will inform the Government on the potential for geothermal energy for purposes of power generation especially in the form of electricity.

Q: What are the potential harms or risks of the researches done by the group?

A: Our research is done using passive field methods. They are non-invasive and therefore are not a hazard to the environment.

Q: Are your methods new or widely accepted in your field?

A: We are not inventing new equipment nor using new methods. We are using known equipment and scientifically accepted methods to bring out new information on where to expect aquifers and carry out models that will estimate how much water to expect stored underground.

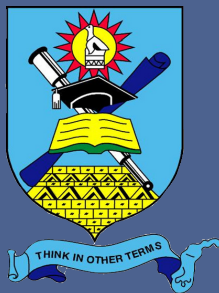
In investigations on the geothermal energy



Professor Dumisani John Hlatywayo
Department of Applied Physics

potential, we are interested in finding out the heat sources beneath the earth structure that are responsible for hot-springs. Besides characterising the hot springs, new information on the lithology, faults and fracture zones for the area that is host to the hot-springs will be documented.





NATIONAL UNIVERSITY OF
SCIENCE AND TECHNOLOGY

9th Annual Research Day 2022



**THEME: Innovating for
development and economic
growth using Education 5.0**

Annual Research Days:

4-5 August 2022



For more information on registration and other details contact:

Mrs. Julia Mabvira: julia.mabvira@nust.ac.zw

Dr. Paul Makoni: paul.makoni@nust.ac.zw

fill in the online survey: <https://forms.gle/j7fXrDBedf8X38aw5>



Zimbabwe Journal of Science and Technology

Call for papers



NATIONAL UNIVERSITY OF
SCIENCE AND TECHNOLOGY

Aims and Scope

The ZJST publishes science and technology research papers reporting significant experimental, theoretical and observational extensions of the scientific and technological phenomena.

As from volume 11 (2016), the ZJST is now publishing papers in basic and applied sciences, engineering and technology, clinical and computing sciences.

ZJST is an Open Access journal and it does not charge any handling fees.

Submitting Papers

Manuscripts submitted for publication must be in strict conformity with the Format for submission provided on the official ZJST site:

<https://www.nust.ac.zw/zjst/>. All manuscripts should be submitted as an email attachment addressed to the editor and sent to zjst@nust.ac.zw. Upon receipt of your manuscript, a tracking number will be assigned and emailed to the corresponding author within 72 hours.

The Editor: Prof A. H. Siwela (NUST)

Department of Applied Biology and Biochemistry

Email: andrew.siwela@nust.ac.zw



RIO staff

NUST continues to break new ground with the appointment of Dr Thembekile Ncube, as the first female Director for Research and Internationalisation Office (RIO). This is a strong statement of the University's commitment to supporting female academics. To enhance the operations of RIO, Mr Israel Mbekezeli Dabengwa was appointed as the inaugural Research Uptake Manager. Meet the experienced and dedicated RIO team.

Dr Thembekile Ncube is the Director for Research and Internationalisation Office. She is the first female academic to hold the post. Previously she was the Chairperson of the Department of Applied Biology and Biochemistry, where she has been lecturing and supervising undergraduate and MSc students since 2003. Dr Ncube holds a PhD in Microbiology from the University of Limpopo, MSc in Microbiology (University of Fort Hare), a BSc Honours in Applied Biology and Biochemistry (NUST) and a Postgraduate Diploma in Higher Education (NUST).

In May 2009, she was a Trainee in Fermentation Technology Unit at the Centre for Scientific and Industrial Research in Johannesburg, South Africa. Dr Ncube has also lectured Food Hygiene and Food Microbiology to Diploma students at the Bulawayo Polytechnic College. She is the Founder and Vice-Chairperson of NUST Women in Science, Technology and

Leadership group, which is concerned with the advancement of women academically as well as in research, innovation and leadership. She is also the Founder and team leader of the Environmental Biotechnology Research Group whose focus is application of microbes in cleaning up polluted environments, utilization of waste materials for biofuels, bio-fertiliser production, and bio-mining technologies. She is the Co-Founder of the Girls Support Girls initiative, which motivates the girl-child in STEM-related careers as well as girl-child related health issues.

Dr Ncube is an award-winning researcher and reviewer of several journals including the Journal of Environmental Science and Technology, Zimbabwe Journal of Science and Technology and International Journal of Environmental Science. She is a recipient of the Presidential Postgraduate Scholarship, PhD



Africa Scholarships (National Research Foundation), 2019 IVLP Women in STEM leadership award (US) and Research grant from Research Council of Zimbabwe (2020-2022). Dr Ncube is a member of various boards including the NUST Council, Pig Industry Board and Biochemistry and Molecular Biotechnology Society of Zimbabwe.



Dr Paul Makoni is a Chief Research Officer. He holds a BSc Honours degree in Biological Sciences, an MSc in Tropical Biology and Fisheries both from the University of Zimbabwe and a PhD in Zoology from the University of Copenhagen in Denmark. For his PhD research he investigated the potential of using biological methods to control vector borne diseases in Africa. Dr Makoni has attended an advanced course on research methodology at the then Danish Bilharziasis Laboratory and has 20 years of research experience. From 1995 to 2000 he was the Curator of Ichthyology at the National Museums and Monuments of Zimbabwe. His duties then included carrying out fish surveys in water bodies around Zimbabwe, advising communal and commercial farmers on fish farming issues. From 2000 to 2003, he was a Medical Researcher in the Ministry of Health and Child Care where he conducted research in vector borne diseases in Zimbabwe. He has lectured to both undergraduate and

postgraduate students at NUST and Midlands State University. Currently he is a Chief Research Officer in the Research and Internationalisation Office. His responsibility entails searching and alerting researchers on available

funding opportunities, pre-award process, conducting training for researchers and postgraduate students to improve their research skills capacity and providing advice on issues of research to academic staff and postgraduate students. He

has run regional and international courses on research methodology over the years. Dr Makoni has successfully supervised several Masters students and 3 PhD students.



Mr Israel Mbekezeli Dabengwa is a Research Uptake Manager. He holds an MPhil in Library and Information Studies from the University of Cape Town, South Africa, a Postgraduate Diploma in Development Studies (NUST), BSc Honours in Library and Information Science (NUST) and a Certificate in Health Education Advanced Leadership for Zimbabwe Programme (University of Zimbabwe).



Dr Cinderella Dube is the Research Administrator. She holds a Doctor of Philosophy Degree in Business Administration from NUST, a Master Degree in Education Administration, Planning and Policy from the Zimbabwe Open University and a Masters Degree in Business Administration from NUST. Dr Dube has published several research papers in several refereed journals and has presented a number of papers at national and international conferences. She has also been involved as a key player in a number of national and external funded grants at institutional and national levels.

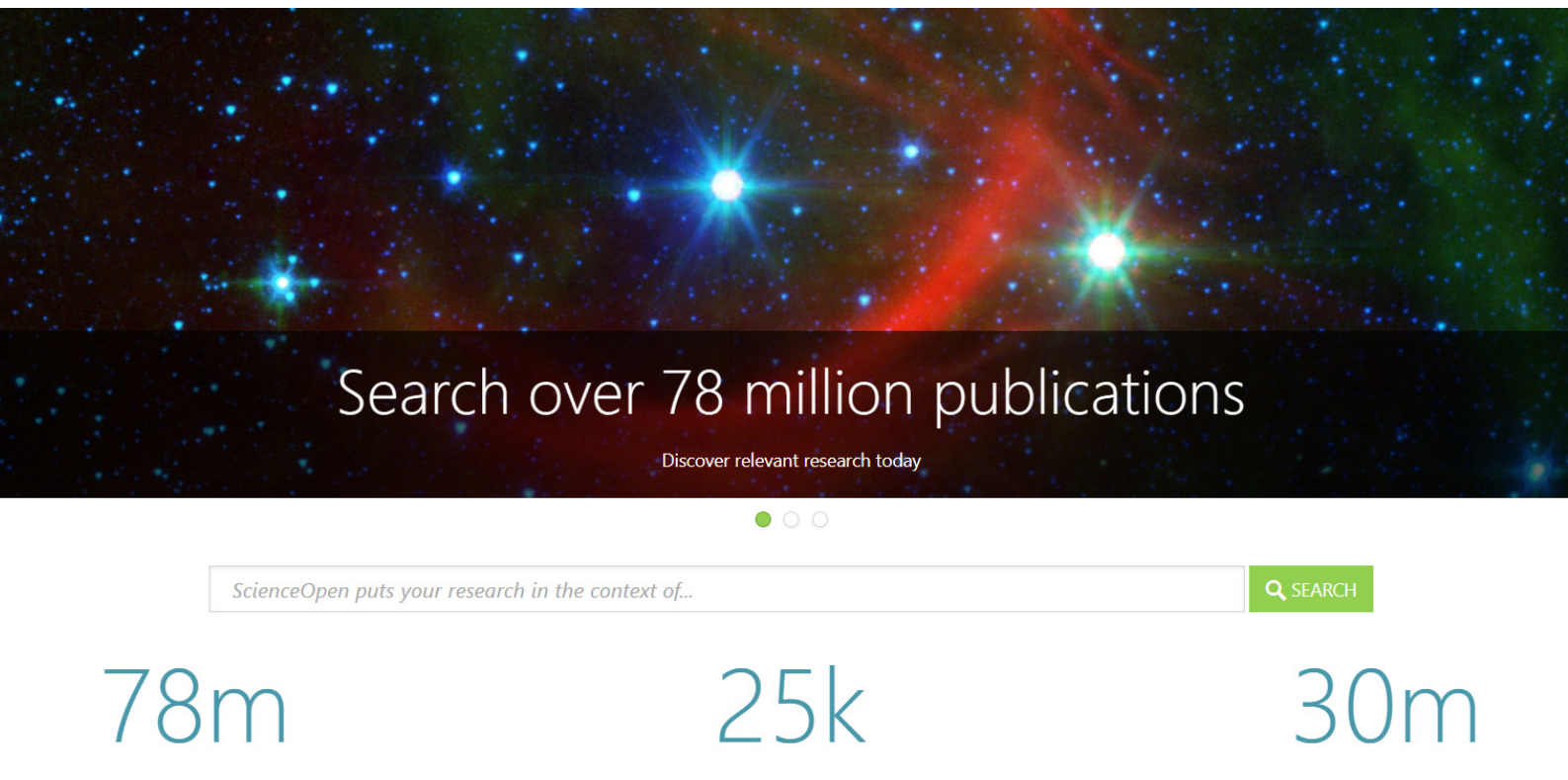


Mrs Thembelihle Chaza is a Research Fellow. She holds an MSc in Applied Microbiology and Biotechnology (NUST) and a BSc honours in Biological Sciences (MSU). Her research interests are in Biochemistry and Environmental Biotechnology. She is currently working on the development and commercialisation of innovative products in conjunction with Innovation & Business Development.



Mrs Julia Mabvira is the Chief Secretary. She holds a BSc Honours Degree in Business Management, and a National Diploma in Secretarial Studies.

Want to perform a literature search and don't want to pay for Web of Science or Scopus or perhaps you are tired of the limited functionality of the free Google Scholar?



The image shows a screenshot of the ScienceOpen website. The background is a dark space with colorful nebulae and stars. The text 'Search over 78 million publications' is prominently displayed in white. Below it, in smaller text, is 'Discover relevant research today'. There are three small circles (green, grey, grey) below this text. A search bar with the placeholder text 'ScienceOpen puts your research in the context of...' and a green 'SEARCH' button is visible. Below the search bar, three large numbers are shown: '78m', '25k', and '30m', each with a small horizontal line underneath.

Search over 78 million publications

Discover relevant research today

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78m 25k 30m

Search results are clearly labelled by type of publication, number of citations, altmetrics scores, etc. and allow for filtering. You can also access citation metrics.

<https://www.scienceopen.com/>

Calls, conferences and workshops

Grants and funding opportunities

Fund for Innovation in

Development Grants – enables innovators and researchers to test new ideas, build rigorous evidence of what works, and scale the highest-impact and most cost-effective solutions. No deadline, grants are accepted all year round. Paste and go to:
<https://fundinnovation.dev/en/>

PhD funding opportunity:

Routledge/Round Table

Commonwealth Studentships – The studentships provide support for research projects on Commonwealth-related themes. Two studentships are available: one for UK-registered students and one for Commonwealth students in other countries. Deadline: 31 July at 23:59 UTC. Paste and go to:
<https://crm.acu.ac.uk/civcrm/mailling/url?u=6406&qid=253589>

Tackle sexual harassment: apply for a Martha Farrell Fellowship

– Sexual harassment should be treated with zero tolerance - but contesting this kind of behaviour on campus can be challenging. Martha Farrell Memorial Fellowships equip ACU member university staff with the training and support needed to implement effective anti-sexual harassment initiatives. Deadline: Tuesday 12 July at 15:00 UTC. Paste and go to:
<https://www.acu.ac.uk/get-involved/martha-farrell-memorial-fellowship/>

Laerdal Foundation Funding for

Health – supports financial support to practically oriented Research and Development in acute medicine. The last few years an added focus has been given to projects relating to saving lives at birth in low-resource settings, based on the UN Sustainability Goals. Deadline October 1. Paste and go to:
<https://laerdalfoundation.org/saving-lives-at-birth/>

Upcoming events

Our rights, Our lives, Our future plus (O3 PLUS) (5-17 November 2022) –

Submit abstracts to Professor Vongai Zvidenga Nyawo on vnyawo@gzu.ac.zw, and Dr. Munatsi Shoko on, m.shoko@unesco.org by 5pm CAT on 30 June 2022

Southern African Research & Innovation Management Association

(1-4 August 2022) – Paste and go to:
<https://conference.eventsair.com/QuickEventWebsitePortal/2022-sarima-conference/sarima2022>

International Conference on Communication And Information Science (23-24 August 2022) – Paste and go to:
<https://www.nust.ac.zw/index.php/international-conference-on-communication-and-information-science.html>

2nd International Conference on Education for Sustainable Development (14-16 September 2022)

– Paste and go to:
<https://www.nust.ac.zw/index.php/education-for-sustainable-development.html>

New Scientist Live London (7-9 October 2022)

ExCeL London & Online – Paste and go to:
<https://live.newscientist.com/>