FAST4Future Newsletter/*Issue #1*/August 2024

Message from the Chair of the Dissemination and Outreach Committee – Prof. T. Demissie

Dear FAST4Future Community, I am thrilled to share our latest updates and achievements in this edition of the FAST4Future newsletter. Our project continues to make remarkable strides, thanks to the dedication and hard work of our team and partners. We have exciting events lined up, innovative research outcomes to discuss, and inspiring stories of collaboration to share.

Your support and engagement are crucial to our success. Together, we are paving the way for a sustainable and prosperous future. Stay tuned for more updates and join us in our journey towards a brighter tomorrow.

Join us for this journey into the future!

Follow us on X: **@Fast4future2023**

Erasmus+ capacity building in higher education

FAST Focus on African Space Science and Technology for Future Development

Welcome Remarks from the Coordinator

Prof. F. Franchi

It is a great honour for me to introduce to all stakeholders and to the public this new idea called FAST4Future (Focus on African Space Science and Technology for Future Development). This project, funded by the EC through the programme Erasmus+ Capacity Building in Higher Education, stems from a sister initiative called PAPSSN – Pan African Planetary and Space Science Network (https://www.papssnmobility.org). FAST4Future aims at fostering collaboration across Africa in the strategic field of Space Science and Technology (SST).

FAST4Future brings together academics from Botswana, Italy, Nigeria, South Africa, Sweden, and Zambia. The common goal of this large consortium is the internationalization of SST programmes in African institutions and the creation of a Centre of Excellence in Space Science and Technology (CESST - https://cesst.org) that can become a beacon in Africa for inclusive science and for dissemination of cutting-edge academic contents.

It is also through instrumental tools such as this newsletter that we strive to become as inclusive as possible and reach far and wide the community of STEM students, professionals, and amateurs in Africa, regardless of their geographical position and cultural background.

We believe that Space Science is the future of this continent and as such we need to make sure that each African can take part in this exciting process that will put Africa at the forefront of Space Science and exploration.

Geo-Space Science

By Dr Stephanie Enslin

Geology and space science are intertwined disciplines that illuminate our understanding of Earth's past, present, and future. Geologists study the planet's composition, structure, and history, examining rocks, minerals, and fossils to unravel the story of Earth's evolution over billions of years. Space science, on the other hand, explores the broader cosmos, including the Sun, planets, asteroids, and comets, shedding light on the processes that govern celestial bodies and their interactions. These fields intersect in numerous ways, such as the study of meteorites, which provide insights into the early solar system and Earth's formation. Additionally, geologists investigate impact craters and volcanic landscapes, drawing parallels with extraterrestrial features found on other planets and moons. Understanding geological processes on Earth informs our interpretation of similar phenomena observed

BOTSWANA HOSTED THE 2023 FAST4FUTURE STEM FESTIVAL AT MAKGADIKGADI COMMUNITY JUNIOR SECONDARY SCHOOL

Botswana hosted the 2023 FAST4Future project STEM Festival at the Makgadikgadi Community Junior Secondary School in Mosu Village. This event was made possible through a collaborative effort between the FAST4Future team members Prof. Taye Demissie, Dr. Pulane Koosaletse-Mswela from the University of Botswana and Dr. Haniso Motlhabane from BIUST, and the renowned Diamond Mining Company, Debswana.

The festival kicked off on November 16, 2023, with a dedicated Teachers Training Program. Educators from schools across the region gathered to enhance their knowledge in Planetary and Space Science and Technology. The dynamic sessions, led by the FAST4Future team, provided valuable insights that promise to ignite a passion for science among teachers and students.

As the sun set, the festival took a magical turn with a Nighttime Storytelling Program from 7 pm to 10 pm. Attendees, including a significant number of students and teachers, were treated to traditional Tswana stories that wove tales of stars and planets. The event not only entertained but also fostered a deeper connection with the rich cultural heritage surrounding celestial wonders.

The momentum continued November 17 with a day filled with STEM activities. A

throughout the solar system, while insights gained from planetary exploration deepen our comprehension of Earth's geological history.

Postgraduate Experience

My name is Josephine Chishala, an Astrophysics master's student at Botswana International University of Science and Technology (BIUST) under the supervision of Prof Roberto De Propris and Dr Mirjana Povic. My current research is 'investigating Merger-AGN connection between galaxies in close galaxy pairs'. I am very excited to be able to contribute to the Scientific knowledge in space science through my project.

My experience in Space Science has been amazing from the first moment I was introduced. I have been able to learn a lot from both theoretical and observational work, I have had a very good working environment surrounded with people that are committed to teaching and guiding me as I do my research. I have also been privileged to attend different events (e.g. summer schools, workshops, etc.) where I

Science Circus, captivating demonstrations by the FAST4Future team, and a STEM Hub Handover Program sponsored and organized by Debswana marked the day. These engaging activities aimed to inspire the next generation of scientists and innovators, showcasing the exciting possibilities within the realms of science, technology, engineering, and mathematics.

The 2023 FAST4Future STEM Festival not only bridged the worlds of academia, industry, and culture but also ignited the minds of educators and students alike. With Debswana's dedication and the expertise of academic leaders, the event fostered a passion for science and exploration, laying the foundation for a brighter, more innovative future.

UNIVERSITY OF THE WITWATERSRAND IGNITES THE 2023 FAST4FUTURE STEM FESTIVAL

The **FAST4Future** team at the University of the Witwatersrand (Wits) took center stage in science, technology, engineering, and mathematics (STEM) with its vibrant hosting of the **2023 FAST4Future STEM Festival**. The event featured an engaging TikTok challenge and a captivating showcase of space science, drawing attention to the university's commitment to advancing STEM education (**FAST4FutureTikTok**). To merge entertainment and education, the team at Wits launched a TikTok challenge in October 2023 that encouraged students to participate in a dance and educational video challenge promoting space science.

The **#fast4future** hashtag garnered an impressive 6099 views. However, participation was limited, with only 12 videos uploaded. Challenges notwithstanding, two student groups showcased their dance prowess, while the School of Geoscience at Wits contributed a creative video. Additionally, FAST4Future researchers presented three videos introducing themselves, and five STEM education videos were crafted by a dedicated researcher (**Prof. Snow**, **Dr. Enslin**, **Prof. Franchi**). Due to the lower-than-expected

had the opportunity of meeting experts in various fields and managed to forge relations with different people who enjoy space science as much as I do.

The challenges that most of African students face (myself inclusive) are that firstly most African communities and universities do not recognize Space science or astronomy as a career choice or program therefore there are very few universities that offer space science programs (especially at undergraduate level) hence limiting the amount of exposure needed for further studies, moreover we have very limited options of schools and research titles when preparing for postgraduate studies. The other challenge we face is the lack of funding, however I was very privileged to be awarded a scholarship from the PanAfrican Planetary and Space Science Network (PAPPSN,) and I am very grateful, thanks to the scholarship I have all the equipment I need for my research, therefore not facing any delays.

In conclusion, overall, I have had a very nice experience with my studies in space science.

participation, only first and second prizes were awarded for the dance competition.

On October 7th, 2023, the FAST4Future project took the spotlight at the Vice Chancellor's Top Achievers Day at Wits University. Professor Susan Webb demonstrated how magnetometers could map the earth's subsurface, showcasing their applications in space science. The instruments used in the demonstration mirrored those on satellites, opening discussions about FAST4Future's pivotal role in advancing space science across Africa. Professor Susan Webb commented on the event: "Despite the challenges faced during the exam season, it's heartening to see the enthusiasm and potential in our students. The TikTok challenge was a creative way to blend fun and education, and the showcase at the Vice Chancellor's Top Achievers Day emphasized the impact FAST4Future is making in space science on the continent."

Wits continues to lead the charge in promoting STEM education and fostering a spirit of innovation among its students. The university remains committed to nurturing the next generation of scientists and researchers.

2023 FAST4FUTURE STEM FESTIVAL HOSTED AT THE UNIVERSITYOF NIGERIA, NSUKKA

On 30th October 2023, the FAST4Future STEM Festival took the stage at the Faculty of Physical Science auditorium at Nsukka campus of the university. The event was part of one week orientation programme for freshmen being matriculated into this first indigenous university in Nigeria. Participants were drawn from various academic departments in faculties of physical sciences, biological sciences, and engineering. Participation in the STEM festival was impressive as over 200 students at different levels of study took part in the event.

During the event, there were exhibitions and demonstration of scientific investigation strategies. In one of the demonstrations, Prof. Finbarr Odo emphasized the importance of distance determination in space exploration and demonstrated to the participants, an open field experiment on how astronomers can estimate distances to astronomical objects. There was also demonstration on the use of optical telescope for viewing celestial bodies. For the first time in their

I have not only had a better understanding of the universe but also learnt to embrace the diversity of perspectives and cultures which has compelled me to pursue further understanding.

Announcement: Astronaut Christer Fuglesang's Visit to Southern Africa

We are excited to announce that renowned astronaut **Christer Fuglesang** will be visiting South Africa, Botswana, and Zambia at the beginning of October! This is a rare opportunity to hear from one of the few individuals who have ventured into space. Fuglesang will share his experiences, insights into space exploration, and the future of space science.

Public Lecture Series:

- University of the Witwatersrand (Wits), South Africa
- University of Botswana (UB), Botswana
- Botswana International University of Science and Technology

life, some of the participants with awe watched the beauty of the African sky through the optical telescope.

The panel discussions featured stakeholders in science, technology engineering and mathematics education, including the Head of Department of Physics and Astronomy, Prof. Paul Asogwa, who represented the Vice Chancellor, the President of Astronomical Society of Nigeria, Prof. Augustine Ubachukwu, FAST4Future team members from University of Nigeria, Nsukka, representatives from the Centre for Basic Space Science (CBSS) and STEM based departments of the university.

In the panel discussion, the President of Astronomical Society of Nigeria, Prof. Augustine Ubachukwu took the panel through a memory lane of astronomy and space science development in Nigeria and lamented the dwindling interest of young African students in the field of space science. He expressed hope of rekindling the interest in space science among young students through FAST4Future.

In his remarks, Prof. Asogwa who is the Head of Department of Physics and Astronomy of the University expressed gratitude to the European Union for investing huge resources through the FAST4Future project to advance STEM education and activities in Africa and encouraged participants to ensure that the opportunities offered through STEM by European Union do not elude them. In his words, 'I encourage you to utilize the opportunities offered by the European Union through FAST4Future, to build your STEM potentials to be globally marketable in the current JAPA trend in Nigeria'.

In conclusion, the STEM festival was a successful one and the Nigerian FAST4Future team and the entire community eagerly await the next edition of the programme.

SANSA STEM FESTIVAL 2023

As part of the **FAST4Future** activities for **WP7**, **SANSA** hosted a week-long STEM festival during World Space Week, 2-6 October 2023. The event included four days of activities for learners ranging from primary school to high school, a public lecture, and a workshop for early career scientists on giving lectures to the public or to learners. These events were co-organized by the SANSA Science

(BIUST), Botswana
- University of Zambia (UNZA), Zambia

These lectures will cover topics such as space missions, the importance of scientific research in space, and how space exploration can benefit humanity. Whether you are a student, researcher, or space enthusiast, this is an event you don't want to miss!

Stay Tuned:

- **Exact dates, times, and venues** will be announced soon.
- Follow us on social media for updates and event details.

Join us for an inspiring journey beyond the Earth with Christer Fuglesang!

FAST4Future Workpackage 7 Team Ready for 2024 STEM Festivals

The **Workpackage 7 team of the FAST4Future project** is thrilled to announce our participation in the **2024 STEM Festivals** across

Engagement team and the FAST4Future team. Approximately 150 learners participated, and the public lecture has been streamed 108 times on youtube. The student activity events were generally a half day. Beginning with slides and movies about what space weather is and how it affects technology and society, then followed by an informal chat about what it's like to be a scientist, led by Prof. Martin Snow. Students generally had many questions, ranging from rainbows the power outages. The students then got a tour of the SANSA Space Weather Centre where a Forecaster gave a description of the current conditions. The learners then spent a few hours doing

hands-on activities: building a model cubesat, using a balloon to propel a vehicle, and building a rocket powered by compressed air. The primary school learners did an activity on the interior of the Earth rather than building rockets. They coloured in the various layers of the interior: the core, the mantle, and the crust on a flat piece of paper and then turned it into a cross section of the Earth.

The final activity for the learners was to visit the many hands-on exhibits in SANSA's certified Science Centre. The public engagement activity was a lecture given by Prof. Martin Snow titled "Storms from the Sun: protecting tomorrow's technology." It was livestreamed to youtube, and delivered in-person to a crowd of about 50 people in Hermanus.

The final component of our STEM festival was a workshop led by the UK Space Academy for early career scientists. The topic was on how to give science talks to the public. There were tips on making eye contact, choosing accessible language, the speaker's body language, and timing. The workshop was attended by graduate students, post docs, science support staff, and a few senior scientists.

Overall, the week-long STEM festival was a huge success. More than

Botswana, Zambia, Nigeria, and **South Africa**! These festivals aim to ignite a passion for science, technology, engineering, and mathematics (STEM) among students and the broader community.

Our team is prepared to engage with participants through interactive demonstrations, hands-on workshops, and thought-provoking discussions. We believe that fostering STEM education is crucial for empowering the next generation of innovators and problem solvers.

Stay tuned for more details on dates and venues. Let's inspire the future together with FAST4Future!

Space Science for Economic Development

Space science plays a crucial role in advancing education and economic development by inspiring innovation, enhancing technological capabilities, and fostering a deeper understanding of our universe. It drives educational initiatives

150 learners and 100 members of the public were engaged in these activities. The support of the SANSA science engagement team was essential to the success of this festival, and we deeply appreciate their collaboration with FAST4Future.

ASTRONOMY AND SPACE SCIENCE ACTIVITIES IN ZAMBIA

The first ever science festival under the FAST4Future project was held in the mining town of Kasempa in Northwestern Province. Kasempa was selected to hold the activities mainly because it is the site for the Square Kilometer Array (SKA) in Zambia. There were preceding activities to the science fair.

These included a teacher training workshop for science teachers drawn from Kasempa based high schools. 27 teachers participated in this training. The training workshop was an important part of the STEM festival because the teachers are considered among the best vehicles for the transfer of science skills and knowledge especially that this is a rural set up with not so many people who have very limited knowledge about astronomy and space science. The training workshop was held at Kasempa Day Secondary School because it is more central, and it is also the district STEM school. The FAST4future team worked in conjunction with a team under the office of the National Astronomy Education Coordinator (NAEC) which had planned the training workshop since FAST4future works with existing structures in the promotion of STEM at various levels.

In order to increase the reach to the public, we organised two live radio shows on the theme of space science and astronomy. Each radio show was for one hour. Listeners were given time to phone in and ask questions. The discussions were based on the development of astronomy and space science in Zambia. However, the questions that were asked by listeners covered the wider science topics that required scientif explanation.

The Kasempa Radio Station is a community radio station with audience of around 500,000. Their motto is 'Putting the Community First'. The station management was please to air this inportant science radio show and

that cultivate critical thinking, problem-solving skills, and STEM proficiency among students, preparing them for careers in high-demand fields. Economically, space science fuels industries such as telecommunications, satellite technology, and data analysis, leading to job creation, improved infrastructure, and national competitiveness. By investing in space science, nations can unlock new opportunities for sustainable growth, international collaboration, and a future powered by knowledge and discovery.

looked forward to further collaboration with the FAS4Future project.
Mrs Yaki Chiyokoma Namiluko and Mr. Prospery Simpemba featured on the first phone-in radio show whereas Dr. Saul Paul Phiri and Mr. Jackson Siantuba featured on the second radio show.
The hot question was on the story of an asteroid that was believed to have fallen in Kasempa a few months back and the callers wanted to know about how safe they were from such astronomy events.

The science festival had two categories: the junior and the senior categories. Pupils presented science projects showcasing various technologies. Awards were given to pupils with best projects. After the science fair there was a debate on whether investing in astronomy and space science is a waste of money.

All the above activities took place over three days. The closing ceremony was graced by the Provincial Deputy Permanent Secretary for North Western Province in the Company of the District Commissioner for Kasempa District and officials from the Ministry of Education. The last activity involved the unveiling of a bill board for the SKA Zambia site in Kasempa, named Kasempa Radio Astronomy Observatory (KASERAO). This is a one kilometre square piece of land allocated to the Government of the Republic of Zambia by His Royal Highness Senior Chief Kasempa.