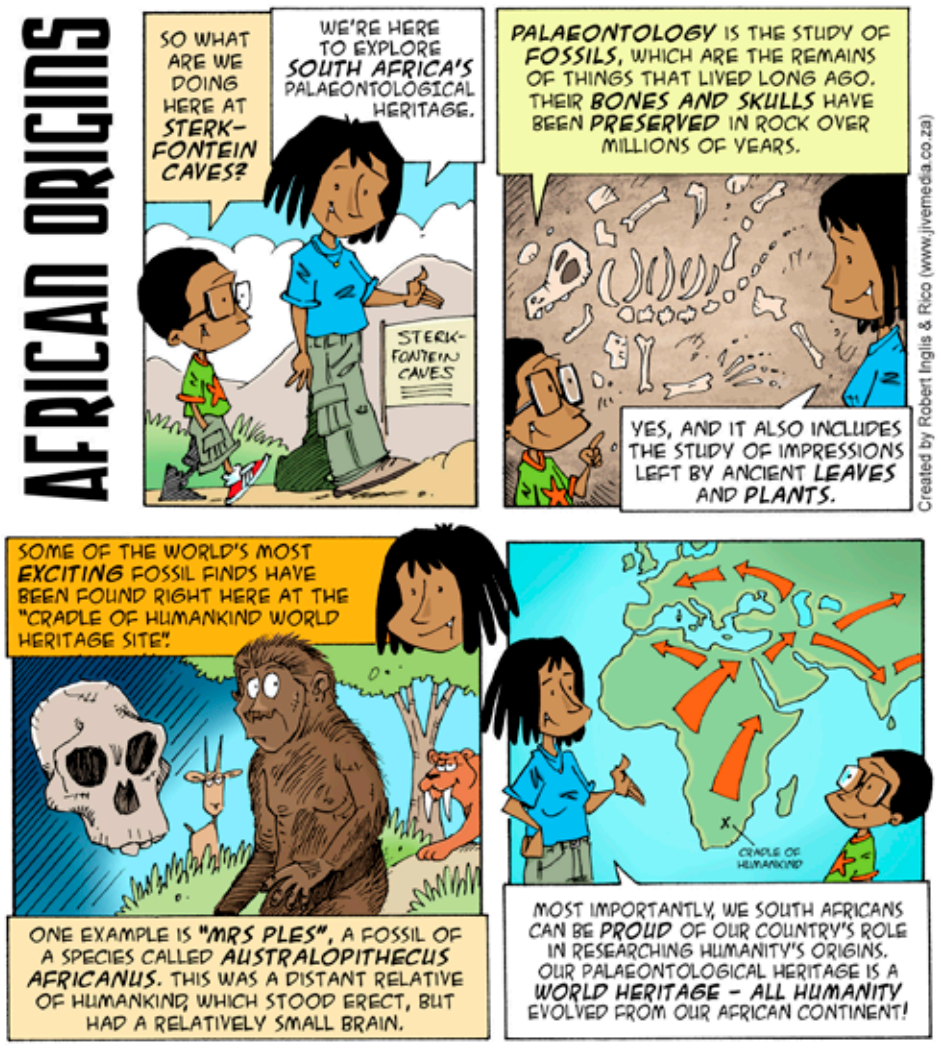
SCIENCE SPAZA SPACE
Knowledge is Ncah!
ISSUE 4, OCTOBER 2015
www.sciencespaza.org Facebook: ScienceSpaza

Homo Naledi: Rewriting History Books

Nelani Mbokazi

South Africa announced the astonishing discovery of a new Hominin (Human) species, *Homo naledi,* during Heritage month. Ongoing research on the Hominin fossils, first discovered in a cave 50km from Johannesburg in 2013, has finally yielded its results.

The Wits University team initially found a deep cave 90m below ground. Inside were around 1500 fossils of Hominin species, making this the largest Hominin fossil deposit ever found in Africa. Scientists recovered parts of at least 15 individuals of *Homo naledi* (of all ages). It is thought that this could be a burial site for *Homo naledi*. Burial rituals are thought to be unique to humans, but it is strange to think that primates who lived millions of years ago practiced ritual behaviours similar to us today! This is what makes *Homo naledi* one of the greatest discoveries in history. The cave was named the *Dinaledi Chamber*, meaning the "chamber of stars", and the area is now a heritage site. The oldest evidence of Hominin species was discovered in this area too. Debates remain around exactly where *Homo naledi* fits on the human origins tree. The first Hominin species, *Homo habilis*, evolved to *Homo ergaster*, which gave rise to *Homo erectus*, thought to have moved out of Africa to the rest of the world, giving rise to *Homo sapiens* (us!). Somewhere along this timeline, fits the exciting new discovery of *Homo naledi!*



Many species of hominin, including *Australopithecus africanus* (see above), have been discovered at the Cradle of Humankind.

Hip Hop Health Science Spaza

Samukele Mbanjwa

The Hip Hop Health initiative creates an engagement space for youth, health researchers and popular music artists to collaborate on health-related development challenges affecting our communities. Science Spaza, together with the **Wellcome Trust**, came up with a program to educate young pupils on water and health.

Hip Hop Health Science Spaza hosted a concert at the Hexagon Theatre with three schools in the Mgungundlovu District, namely Mehlokazulu, Emzamweni and Sobantu Secondary. In preparation for the show, the learners had the opportunity to work with professionals, researching and learning more about water and health. With this new knowledge, they worked with local musicians to create Hip Hop songs, focusing on raising awareness of the importance of water in their communities. Water is the source of life! If we don't take care of it, there'll be no life to take care of.

On the day of the concert the students, along with friends and family, arrived at the Hexagon Theatre. They were ecstatic to be handed the opportunity to meet and perform for the project partners and iFani, a nationally recognised, influential artist. He later graced the stage with a few words of wisdom, inspiring the youth to dream and learn.

Popular artists including iFani (above), scientists and learners who had conducted research into water and health got together for the ultimate collaboration.

Each group showcased their talents, preaching the word of how important water is for life to prosper. The Emzamweni River Renegades asked the audience to "respect what gives you life". This lyric highlights exactly what the project aimed to do.

Projects like Science Spaza empower the youth to take matters into their own hands and change their quality of life!

This edition of *Spaza Space* is brought to you with support from SKA South Africa in celebration of World Space Week 2015

Jive Media Africa

SKA AFRICA
SQUARE KILOMETRE ARRAY

National Science Week Launch 2015

Njabulo Mbedu and Sthabile Mazubane

Science Spaza was invited to the National Science Week launch held at the University of North West on the 1st of August 2015.

The theme for 2015 is **Light and Light-based Technologies** and learners were treated to remarkable and sensational exhibitions. Science Spaza was invited to SABC's *Morning Live* interview early that morning, broadcast on national television! The team spoke about Hip Hop Science Spaza combining Hip Hop and Science, after having recorded a CD for National Science Week 2015.

They then got a chance to attend a presentation by the Minister of the Department of Science and Technology, Naledi Pandor, highlighting the importance of light and light-based technologies in our daily lives. She covered a range of applications, including the screens on our cellphones and light-based technology used in health sciences, for example using lasers in surgery. Dr Sandile Ngcobo, one of the leading digital laser scientists in the world, also presented on being part of the team that developed the world's first digital laser.

It was a great experience to host Science Spaza activities with learners from the North West and neighboring provinces. The looks on their faces and excitement was just out of this world, with many of them signing up their new Science Spaza clubs so that they join the network of clubs across the country. Reaching more learners and giving them the chance to partake in science is a privilege for Science Spaza.

Learners pick up free activity based learning resources from the Science Spaza stand at North West University Photograph: Sthabile Mazubane

Science Spaza at Launch of Giyani Career Centre

Minister of Science and Technology Naledi Pandor hearing about Science Spaza's hands-on approach

Njabulo Mbedu and Nelani Mbokazi

On the 26th of September 2015 Science Spaza was invited by the Department of Science and Technology to be part of the launch of the Giyani Career Centre in Limpopo.

Minister Naledi Pandor opened the Centre, which will provide career guidance to local learners on fields in science which they can pursue at tertiary level.

The Minister visited the stand and learned about the different components of Science Spaza including the Hip Hop Science Spaza music initiative, the quarterly newsletter *Spaza Space* and the activity worksheets distributed to all registered science clubs, free of charge, every term.

Learners participated in fun activities about the science of light, and a number of them signed up new clubs.

Hey guys! It's almost the end of the school year and everyone is getting ready for final exams (we know you'll work hard and do well!) but that doesn't mean an end to the fun as we bring you this exciting edition of *Spaza Space!*

Ground breaking science is taking place in our own country with the discovery of ***Homo naledi***, believed to be a new species of early human! Our **Hip Hop Health** project saw learners researching and writing songs on water related disease, and **National Science Week 2015** was launched in the North West at Mahikeng. Science Spaza was there, as well as being present for the launch of the **Giyani Career Centre** a few weeks later.

Read some fascinating articles: There's **space pollution** which we explore during World Space Week along with some **cutting edge technology** for exploring the Universe. Then there are some creative ideas to **combat climate change** from some young science communicators. Look out for **news from the clubs** where we get to hear and see what YOU have been doing.

And don't forget the Science Spaza **Hip Hop competition 2015**. SEND US YOUR SONG! You could stand a chance to have it professionally recorded! Check out the lyrics from one of our Science Spaza clubs and get inspired!

Finally, if you haven't done it already – sign up your own Science Spaza club! It's super easy and you'll receive activities and more delivered right to you! So what are you waiting for? We hope you will enjoy our final edition for this year – take care during the festive season and look out for us in the new year!

The Science Spaza Team

NEWS FROM THE CLUBS

*This is where you, the members of the **Science Spaza** clubs, get to share your news and have your say about science issues*

Science Spaza club members from Sobantu Senior Secondary are cleaning up!

WHY IS THIS SPACE EMPTY?

BECAUSE WE HAVEN'T HEARD FROM YOU!!

PLEASE SEND YOUR STORIES, LETTERS AND IDEAS TO INFO@SCIENCESPAZA.ORG OR WHATSAPP THEM TO US ON 076 173 7130

Izixovane Science Club

We are the **Izixovane Science Club** from Sobantu Senior Secondary School. Recently, we have been involved in a number of projects, such as the DUCT project and Hip Hop Health Science Spaza.

We've been learning about different plants and the environment! Focusing on topics like alien plant invasion and how to help, we created drama and music – a way to get the message across to the people.

We want to work with and support other local clubs to encourage learners to make a difference. Our parents sometimes hesitate to allow us out on weekends, so we're even inviting them to come with us and see what we are doing to look after our environment! It's also almost exam time, and we are studying hard!

Our main goal is to stop people from littering and negatively impacting ecosystems with pollution.

Kutama Keen Seekers of Knowledge

We are **Kutama Keen Seekers of Knowledge** from Kutama High School. Our club recently won at the Regional Eskom Expo competitions at Vhembe District! We first won against local schools, and then attended the 2nd round held at Thohoyandou on the 14th of August 2015. We displayed our science projects and got 12 silver medals, 11 bronze medals and 6 gold medals! Next up is the National Eskom Expo competition that will be held from the 6th to the 10th of October 2015. We hope to win!

One of our female learners in Grade 9 won the award for the Best Female Project and she is part of the team that will be participating in the national competition.

Emzamweni Science Club

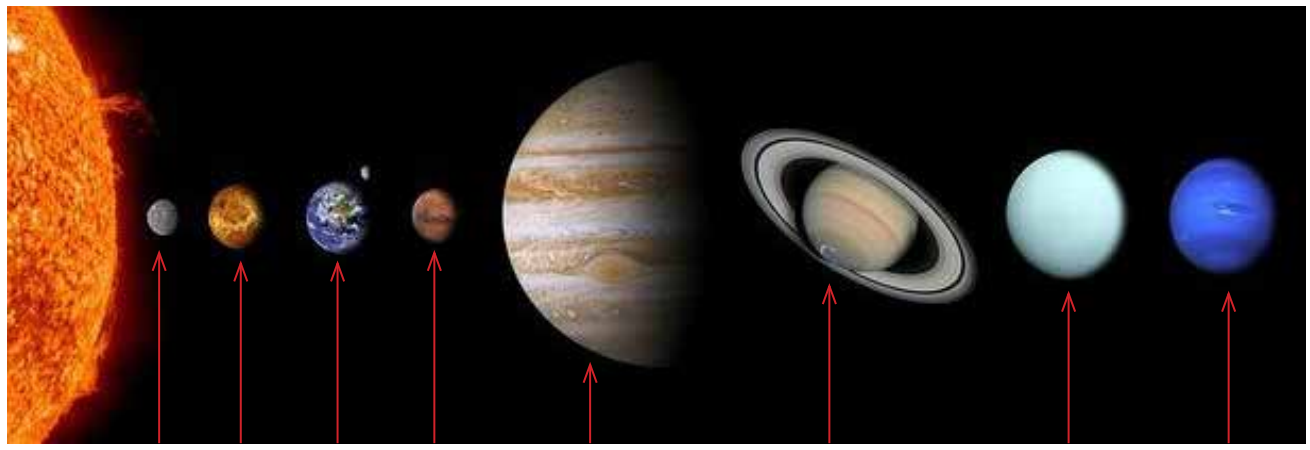
We are the **E.H.S Science Club** from Emzamweni High School and we love science! We've done some interesting projects on water pollution, and found that humans are the main cause! We tested for micro-organisms in the water we use and found so many living things in our river! Although many are part of the ecosystem, some are dangerous to our lives.

Humans can do something to prevent water pollution if they stop littering in rivers and start recycling! Our main aim is to educate people about the dangers of polluting water because it's a scarce resource. Our schedule is very busy as we approach the year-end exams, but we would love to share our knowledge with other learners at school, especially those in lower grades. We can't wait for Hip Hop Science Spaza! We want to be the 2015 Champions!

Space Pollution

Samukele Mbanjwa

Did you know? Our planet Earth is in the galaxy called the Milky Way. Earth is one of eight planets in our solar system and they all orbit around the Sun. The Earth is the only one with an atmosphere that can sustain life. Some of the planets have moons that orbit around them. The Earth has one moon and this moon is the fifth largest of all the moons in the solar system. Our moon is bigger than Pluto, which was once called the ninth planet, but is no longer considered to be a planet.



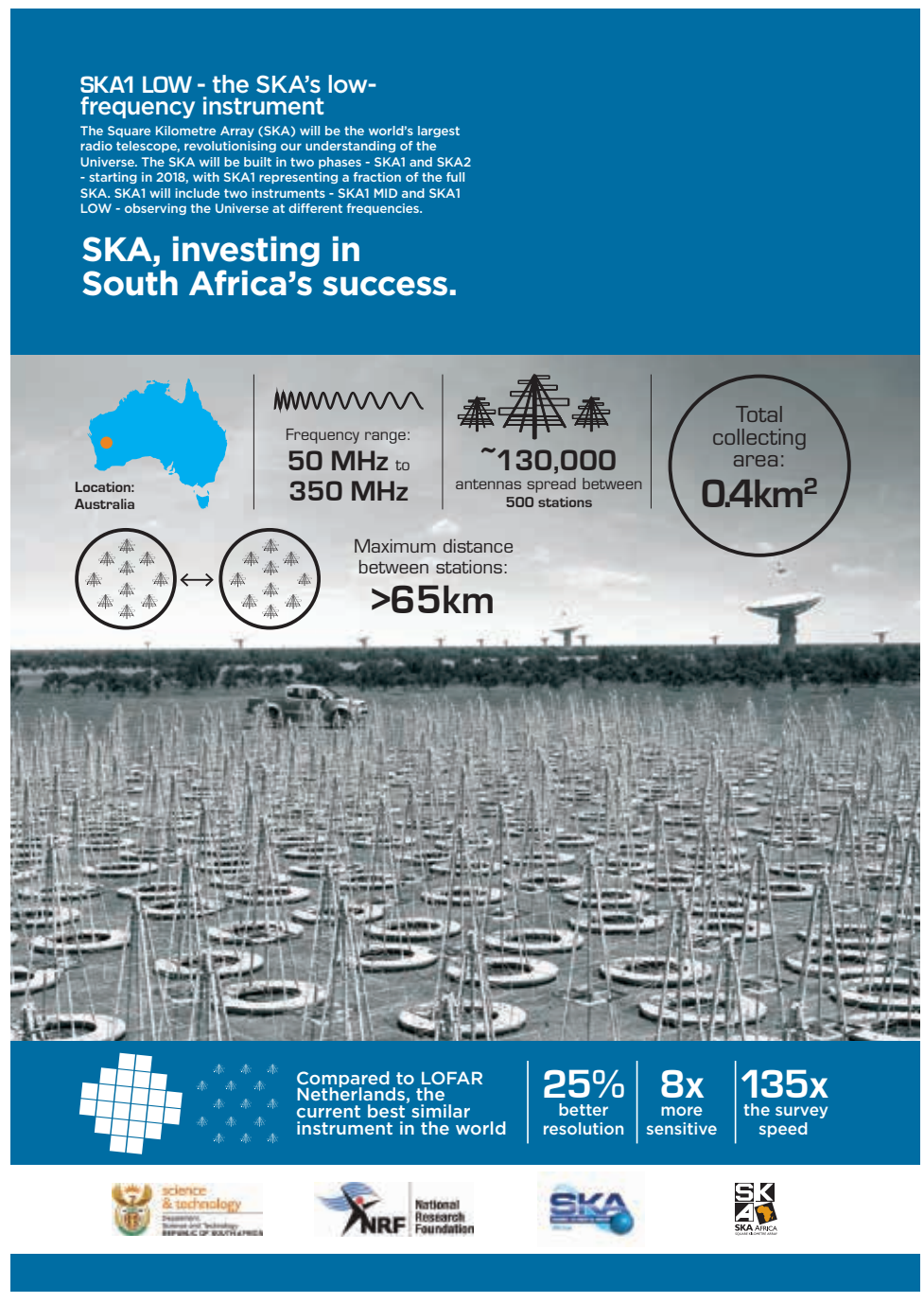
This diagram shows the sun and the 8 planets in order from the nearest (Mercury) to the furthest (Neptune). It is not possible to show the sizes and distances of the planets to scale on a diagram like this. If the Earth was as big as a marble, then the Sun would be as big as a car and Neptune would be 6,5 km away!

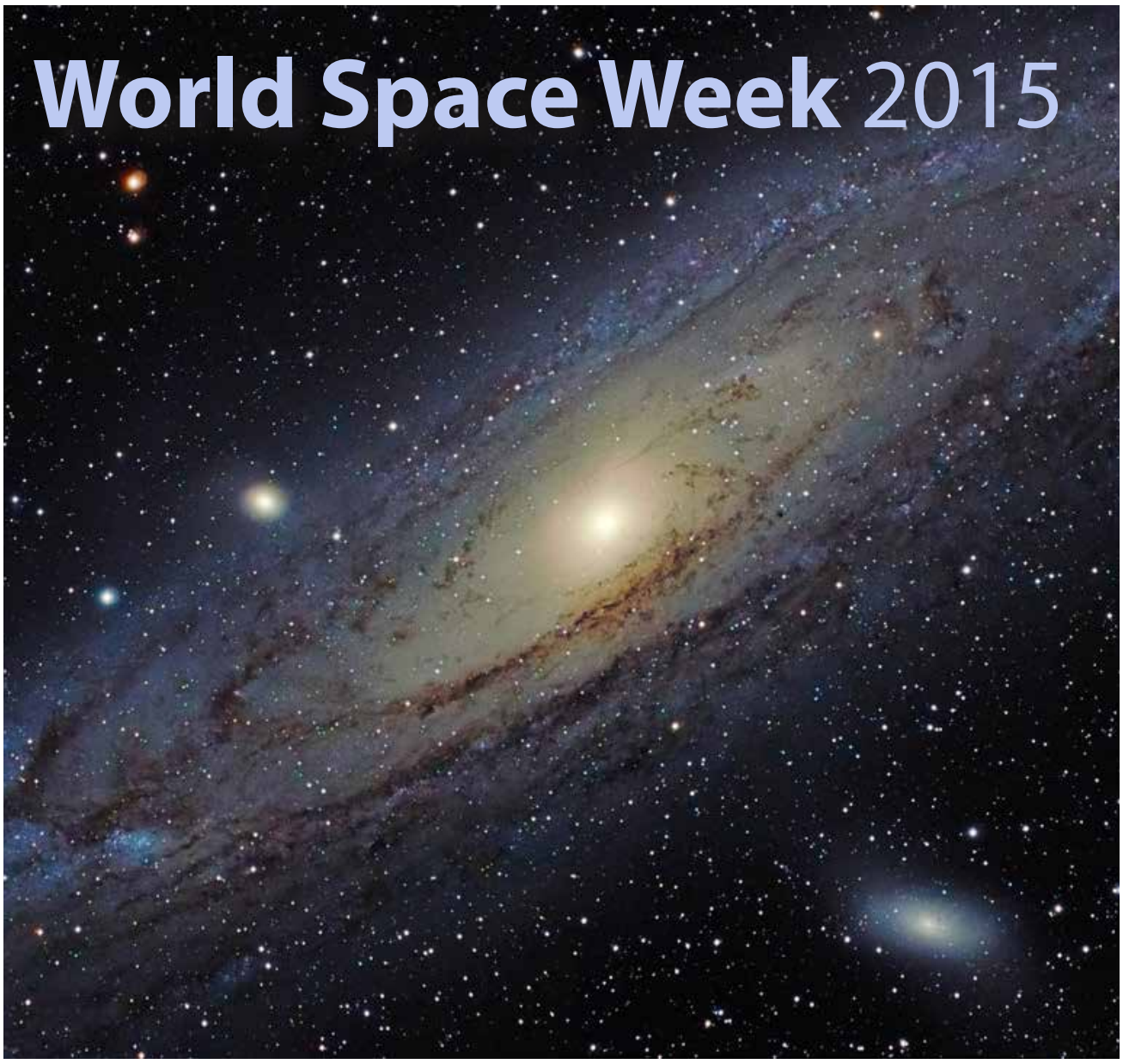
It's great that we know how awesome the solar system and our planet are, but what would be even greater, is if we took the initiative of taking care of our planet, as there are many environmental issues that pose a threat to the survival of the Earth. One of the most problematic threats is the debris that gets deposited in space through space exploration, and which ends up in orbit around the Earth. There are more than 500 000 pieces of space junk (debris) that orbit the Earth. The debris is all moving at a huge speed – up to 28 000 km per hour – so fast that even a small piece could collide with a spacecraft or satellite and do massive damage. And then there would be even more debris in orbit!

If there is a collision between debris and any space vehicle, there is a big chance that parts from the collision will penetrate through the atmosphere and put people's lives at great risk. Therefore it's very important for world leaders to come together and collaborate to come up with solutions to prevent such events from happening.

Thankfully there are programs for research and development of strategies to eliminate all this debris and remove it from orbit. One of these is being developed by Raytheon BBN Technologies together with the University of Michigan. The idea of this Space Debris Elimination system (SpaDE) is to shoot powerful focused pulses of atmospheric gases into the path of the chosen debris. These pulses of air will increase drag on the debris and cause it to slow down, so that it starts to fall into the Earth's atmosphere and burns up. In this way the total quantity of debris in orbit can be reduced.

Space pollution will be an even greater issue in the near future if it isn't attended to with intense urgency. All hope is placed upon the world's experts to deal with such issues, and hopefully the programs aimed at overcoming this dilemma will succeed.





Nelani Mbokazi

Hi guys! It's World Space Week, from the 4th to the 10th of October 2015. This is the most important week in the international field of astronomy.

Never in the history of humankind have we learnt as much about the Universe we live in as in the current time. With the aid of new, cutting-edge technologies, scientists are looking into deep space for answers to the most puzzling questions that we have asked since the beginning of time. Where do we come from? Are we alone in this big Universe? Are there any other forms of life out there? During World Space Week, some of the greatest discoveries made so far will be highlighted. Telescopes, space probes, interplanetary satellites and landers have allowed scientists to explore and study the wonders and opportunities of new worlds: new galaxies with Suns ten times bigger than our own; exoplanets where the sun never sets; planets covered with oceans of lava. Scientists are also discovering planets which they believe can harbour life as we know it, as long as they have liquid water! There might be other forms of life out there, foreign to us. Watch out for World Space Week, where all of these exciting discoveries will be discussed!

SKA Postdoctoral Fellow in Astronomy

Interview with Dr Tana Joseph
(text supplied by SKA)

"To be successful in this field you need a thirst for knowledge, creativity and a love of problem solving."

Why did you choose this career?

I have always loved learning about how the world works. In the '90s I started seeing the images taken with the Hubble telescope and those amazing photos of astronomical objects made me want to be an astronomer.

What training did you undergo, and where?

I completed my BSc and BSc (Honours) in Physics at UCT. I also did my MSc in Astronomy at UCT. I completed my PhD at the University of Southampton in 2013.

What does your job entail?

Astronomers make observations (e.g. images or time series) of celestial objects using telescopes. We then analyse these observations to try to work out the physical processes occurring in these objects. My research entails searching for black holes and neutron stars using X-ray observations taken from telescopes in space. My job also allows me to travel often, either to a telescope to take some observations, to visit a collaborator, or to present my scientific findings at conferences.

What do you enjoy most?

I enjoy making new discoveries and presenting my findings to other astronomers.

What are the most enjoyable aspects of your position?

As a postdoctoral fellow, I have a lot more freedom to do my own research. I really enjoy being able to define my own research and come up with my own ideas for the kind of science I want to do. I also enjoy talking to the public about astronomy and related topics.

Career highlights?

As a student, I was given the opportunity to do six months of my PhD at the Harvard- Smithsonian Center for Astrophysics (CfA), one of the leading astronomical research institutes in the world. I became the first South African to work in the CfA's High Energy Astrophysics Division.

Describe your job in one sentence.

Using data collected from astronomical objects to find out how the Universe works.

Experience vs training?

You gain the necessary experience while you are studying. As a student, you learn to use telescopes and the necessary software to analyse the observations you make with the telescopes. However, you never stop learning as an astronomer. There is always a new software package to learn or a new instrument to use.

What type of person would enjoy this kind of career?

Someone who is curious about the world and wants to find answers to questions about how things work.

Advice for people considering this career?

You will spend many years at university in order to become a qualified astronomer, so be prepared for that and make sure it's what you really want to do.

Potential for growth - where can your current position lead?

The dream of all postdoctoral fellows is to get a permanent job as an astronomer, either at a university or at a research institution. However, astronomers also have many transferable skills (programming, maths, etc.) which are sought-after in many other fields, such as finance, data science or even teaching. So really, there's not much that you couldn't get into.

What challenges have you had to overcome?

When I was starting out as a student there were not many women or people of colour doing science, never mind astronomy. It was sometimes a very isolating experience, but luckily I had support from my family and friends. Things got easier when I started doing my postgraduate studies and saw more women in the field.

Which qualifications do I need?

To be a qualified astronomer you need a PhD in either Physics or Astronomy.

Does the industry (and your type of position) that you are in, face gender bias?

Yes. Science is traditionally very male dominated, so currently the top positions are mostly occupied by men. Things are starting to change now, but it will take a concerted and coordinated effort to make sure that women enter science and science related fields and stay in them.

SKA AFRICA
SQUARE KILOMETRE ARRAY

Urban Algae Farming: A solution to our global warming crisis?

From an article by **Rene Kathleen Naidoo**, submitted to the SAASTA Young Science Communicators Competition

Next time you see some green algae, take a moment to appreciate how these useful organisms help to regulate global warming. Not only does algae capture carbon dioxide, but it can also be harvested as a source of high value substances such as omega 3 fatty acids.

How often have you walked past a pond covered by a smelly layer of green slime, or seen insect-covered seaweed litter on the beachfront, or wondered whether the red tide will poison the seafood supply? These are just some of the negative scenarios associated with algae. Thus, it is not surprising that, given this bad reputation, some of the names commonly used to describe algae include 'pond scum', 'seaweeds' or even 'frog spittle'. Consequently, most people are unaware of the vital role that algae play in our everyday lives and the many benefits that can be derived from them.

These fascinating organisms can range in size from tiny microscopic unicellular creatures to large multicellular macroscopic organisms such as the giant kelps. Together they are responsible for producing 50% of the world's oxygen supply. This is quite a tremendous feat when you consider that the algae represent about one tenth of the biomass of all land plants. They are able to produce large amounts of oxygen because they are extremely efficient at harvesting sunlight and do not waste energy on intricate structures or pretty flowers like land plants. This, coupled with the fact that these organisms yield high biomass and are rich in lipids, makes them extremely attractive candidates as sources of renewable energy. In addition, algae can be cultivated in brackish and salt water sources, including wastewater. They can be grown on non-arable land and as a result do not compete with common food crops, and their ability to thrive under unfavourable environmental conditions makes them extremely versatile and adaptable.

Microalgae, in particular, are seen as very lucrative sources of renewable biofuels, especially biodiesel, as many species contain high amounts of lipids, including triacylglycerides. Macroalgae, on the other hand, are carbohydrate rich and usually contain at least 50% sugar which can be fermented to produce bioethanol.

As if these aren't enough reasons to love the algae, they are also very good at bioremediation and can strip nutrients from polluted waters while simultaneously using excess CO_2 in the atmosphere for growth. In summary, the algae can be used as a source of renewable energy; they can be grown in wastewater streams while simultaneously decontaminating these water sources; and they capture CO_2 from the atmosphere. Now how many organisms do you know that are able to accomplish all of this?

Read the full article at www.agentzee.org

Phyting Climate Change: The Green Gold of the Global Oceans

Emma Lewis Bone: From an article submitted to the SAASTA Young Science Communicators Competition

Oceans hold great treasures - not least, they hold the key to the production of the oxygen we breath.

The global oceans are estimated to contribute an impressive 50-85% of the oxygen (O_2) present in the earth's atmosphere. It is often assumed the Amazon and other rainforests are responsible for atmospheric O_2. However, rainforests cover only 2% of the Earth's total surface area; the oceans cover a remarkable 71%.

The delicate balance between atmospheric components ultimately controls the earth's temperature. Greenhouse gases, including carbon dioxide (CO_2), methane and ozone, absorb and re-emit a wide range of energy (heat). Carbon dioxide is naturally present in the Earth's atmosphere as part of the global carbon cycle.

However, human activities are raising the concentrations to new levels. Carbon dioxide acts as a global blanket and as levels rise, so does the air temperature. This in turn speeds up evaporation and increases the amount of water vapour present in the atmosphere, compounding the warming effect.

It is apparent that our Earth needs O_2 production and excess CO_2 removal. Luckily we have a nifty two-birds-one-stone solution, packaged into sophisticated single-celled organisms known as phytoplankton. The name 'phytoplankton' is Greek in origin, *phyton* and *planktos* describing the 'plant wanderers' that range from the intrepid open ocean explorers to the green stuff in the pool the Kreepy can't reach.

Phytoplankton are self-contained marvels of evolution, using energy from the sun to produce sugar for survival. This complex process is known as photosynthesis, whereby phytoplankton draw CO_2 out of the atmosphere to produce simple sugars, yielding O_2 as a mere manufacturing byproduct.

Not only does this green gold form the basis of the marine food web – it also regulates the gaseous composition of the Earth's atmosphere.

Read the full article at www.agentzee.org

Enter the Hip Hop *Science Spaza* competition

and stand a chance of having your track recorded for the Hip Hop Science Spaza 2016 CD!

The winning song will be professionally recorded and distributed to all registered Science Spazas. Not only will you be learning science, you'll also be teaching it to other science learners across South Africa.

The Hip Hop Science Spaza competition encourages learners in registered science clubs to create original rap, hip hop or songs in other genres in order to convey a scientific principle or concept. Through this we believe that learners will themselves learn, and teach others.

Competition guidelines:

- Choose a science topic from a Science Spaza resource.
- Pick up to 4 facts, write a song and perform it. You can download all the Science Spaza resources for free at www.sciencespaza.org.
- No swearing will be tolerated and songs must be respectful of all people.
- Submissions can be sent via WhatsApp to 076 173 7130 or emailed to info@sciencespaza.org.
- The best of the 2015 competition will, at the discretion of the organisers, be professionally recorded and distributed to all registered Science Spaza clubs.
- The judge's decision is final and no correspondence will be entered into.
- The prize cannot be exchanged for cash or any other prize.
- The closing date is the 30th of November 2015.
- Terms and conditions apply. Visit www.sciencespaza.org for more information.

Top TIPS: How to write a good rap song!

Keep it simple! It must have **rhythm, it must have a beat, it must rhyme!**

Take 4 facts from ONE of your Science Spaza resources and work a rhyme around those four facts. Get your teacher to check that your science facts are correct.

Some tips from our American friends – Google: Science Genius

Content – Generally, what the artist(s) are saying in the song. Different minds like different kinds of content in songs. However, most good songs don't have swearing.

Lyrics – The actual words used to convey what you are trying to say in the song. Lyrics play the biggest role in determining if a song is good or not. Clever wordplay and a nice rhyme scheme can make a song way better. In hip hop/rap, just about every good song is poetic in some way.

Emotion – Emotion also plays a big part in how good a song is. People can feel the emotion in songs like it is part of the beat. Expressing emotion, whether it be anger, sadness, happiness, etc., can always make a song better. It is also how people make personal connections to songs.

Beat – Not much needs to be said about this. Having a great beat can make a song with not-so-good lyrics worth listening to.

There are many more qualities that make a song good, but these are the main ones.

Electromagnetic spectrum

– Galaxy Seekers – Edendale Technical High School

Chorus

Out of space, Out of light,
only SKA telescopes will make u see right
(see right)
Out of grace of the Night, Radio astronomy will make you see bright
(makes you see bright) [x2]

Verse 1

Radio astronomy
Born in the 1930s
Karl Jansky had been able to discover the first two radio waves from the outer space, from the outer space,
From all those astronomic objects.

Am counting planets and stars
Cosmic gases and Mars
And since they all got energy
And emitting radio waves
with the low frequency

Then they travel through space
Reaching grounds of Northern Cape
Striking telescopes built away from the cities
To avoid many signal interferences
Which is
Why we all communicate
It's all because of radio waves
So for them to get a clear picture
They need to be away for a 100 kilometres

Stunning little pictures displayed by them computers
Converted from radio waves
From the outer space
In a colour coded way
That they're showing us the Milky Way
And the burst of Gamma rays

So shout out to Radio telescopes (SKA Telescopes)
I never knew about the Universe and the galaxies
I guess now when those stars align
We all can see
And now I've developed a new dream - Astronomy

chorus [x2]

Verse 2

Radio Astronomy
we see things in the galaxy
how stars are born and how they die is no catastrophe
far beyond the cloud, the skies, galaxy
far beyond the eye YEAH the eye can't see
It's not a world, not a world of fantasy
It's just a world, a world made for you and me
a world made for you and me
It's just a world, a world made for you and me]

chorus[x2]

Verse 3

Hold up, who said I left the mic at the first place
I really know what happened in the real space
and I will never stop until every magazine got my face
but for now just Google me in Yahoo or My Space
(Although waves have a way to travel through space
I make sure astronauts that they sing grace)

[In this world we live in economy seems to change when it come to radio astronomy
maybe my gastronomy lesson has ended for nothing less or nothing more but more radio astronomy
more frequency less emergency for me to see beyond space and radio astronomy will take you out of hate]

(And if the sky is the limit better pray for the night because with SKA I will always reach for the stars)
because with SKA I will always reach for the stars.

Right: Sphesihle Makathini was at Hip Hop Science Spaza to meet the artists and put SKA science in the limelight!

You can listen to this song (and more) on soundcloud.com/sciencespaza

About Science Spaza

Science Spaza is an initiative of Jive Media Africa that aims to improve the teaching and learning of Science, Mathematics and Technology in schools.

The project brings fun, interactive and exciting curriculum-linked hands-on activities to schools, more especially to disadvantaged schools around the country. The Science Spaza activities can be conducted using materials that are easily accessible, materials that learners and educators have at their homes. Part of the goal is to reveal to young people the power of science and technology in transforming their world. The project has established a network of science clubs that are learner-driven so that they can be supported with resources. It also aims at increasing the number of learners who are interested in various science disciplines and turning that interest into science careers.

To keep this project exciting and fun to be part of, Science Spaza has a rousing component called Hip Hop Science Spaza where learners who are members of science clubs write rap songs which can be used to present science facts to the audience in a creative way, and they send them in using WhatsApp or email. A winner has their song professionally recorded and shared with all the other science clubs around the country. This happens each year. The number of science clubs has grown rapidly over the past two years, and learners from all the nine provinces are now registered as part of this network.

To sign up your club visit our website:
www.sciencespaza.org

You can also LIKE us on Facebook:
www.facebook.com/ScienceSpaza

Follow us on Twitter:
@ScienceSpaza

WhatsApp Contact:
076 173 7130

START YOUR OWN SCIENCE SPAZA!

Complete the form below and send it to PO Box 22106, Mayor's Walk, 3208, Fax to 086 610 5453, email: info@sciencespaza.org, WhatsApp it to 076 173 7130 or submit your application online at www.sciencespaza.org

Name of school: _____

Municipality: _____

Province: _____

Name of your science club:

_____

Name of contact person: _____

Telephone number: _____

Email address: _____

Postal address: _____

_____

To be filled in by responsible adult (parent/teacher)

Name: _____

Surname: _____

Position: _____

ID Number: _____

Signature (parent/teacher):

_____

Date: _____

Get in touch – we'd love to hear from you!

Like us on Facebook: ScienceSpaza Whatsapp us: 076 173 7130