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Protect our night sky



Reduce light pollution



This issue of the Bush Telegraph is printed on recycled paper

THE NAMIBIAN NIGHT SKY

Have you ever really looked at the night sky? This evening take a blanket outside, lie down and look up. Wow!

One of the most fascinating things about the night sky is its size. We cannot even begin to understand how big space really is.



The view of the night sky from Namibia is one of the best in the world. We can clearly see the whole southern sky and most of the northern sky very well. That is because we have very little light pollution and extremely dry air compared to other places in the world. Unfortunately many places in the world no longer have a dark sky.

Did you know that there are some stars that are already gone, but we still see the light?

It is important to protect the dark sky because it has:

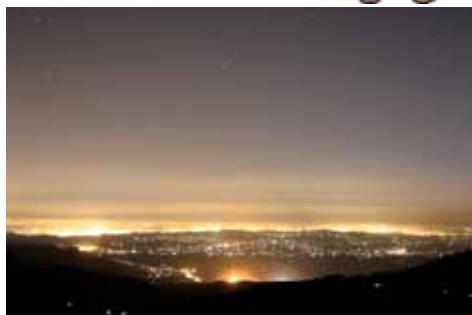
- ★ ecological value
- ★ educational value
- ★ touristic value
- ★ scientific value
- ★ cultural value

....and the night sky is valuable in and of itself!

COMPARE THESE TWO DIFFERENT NIGHT SKIES. BOTH ARE VIEWS FROM OUR PLANET!



NamibRand Nature Reserve, Namibia



San Diego, USA

Did you know?

Astronomers use a Sky Quality Meter to measure the darkness of the night sky. The larger the number measured by the meter, the darker the sky. In large cities like Johannesburg the reading is 17 or lower. At NaDEET the reading is over 22.



WHAT IS EVERYTHING UP THERE, ACTUALLY?

This is the **universe**. Millions of galaxy clusters are all spun together like a spider web.

Gravity pulls stars into huge groups called galaxies. Our galaxy is called the **Milky Way**. The Milky Way, together with its neighbouring galaxies, is called the "Local Group". The Local Group together with many other galaxies make up the "Virgo Galaxy Cluster".

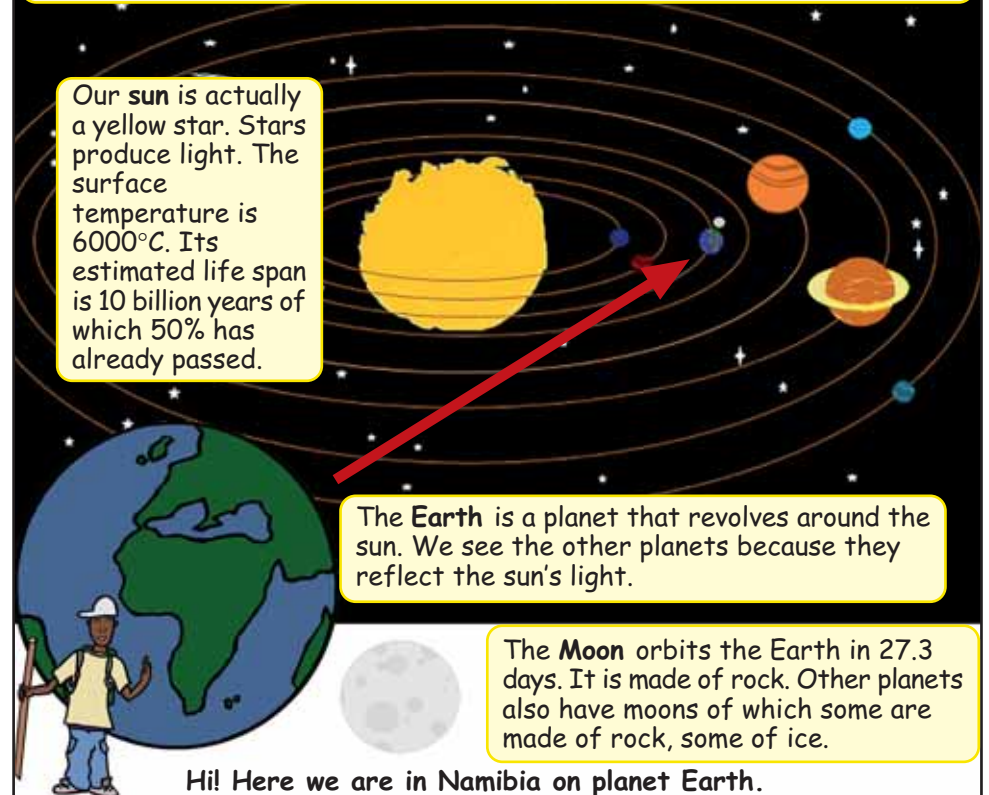
This is our **solar system**. There are eight planets that orbit the sun. The sun and the planets circle the centre of the galaxy every 240 million years.

Our **sun** is actually a yellow star. Stars produce light. The surface temperature is 6000°C. Its estimated life span is 10 billion years of which 50% has already passed.

The **Earth** is a planet that revolves around the sun. We see the other planets because they reflect the sun's light.

The **Moon** orbits the Earth in 27.3 days. It is made of rock. Other planets also have moons of which some are made of rock, some of ice.

Hi! Here we are in Namibia on planet Earth.



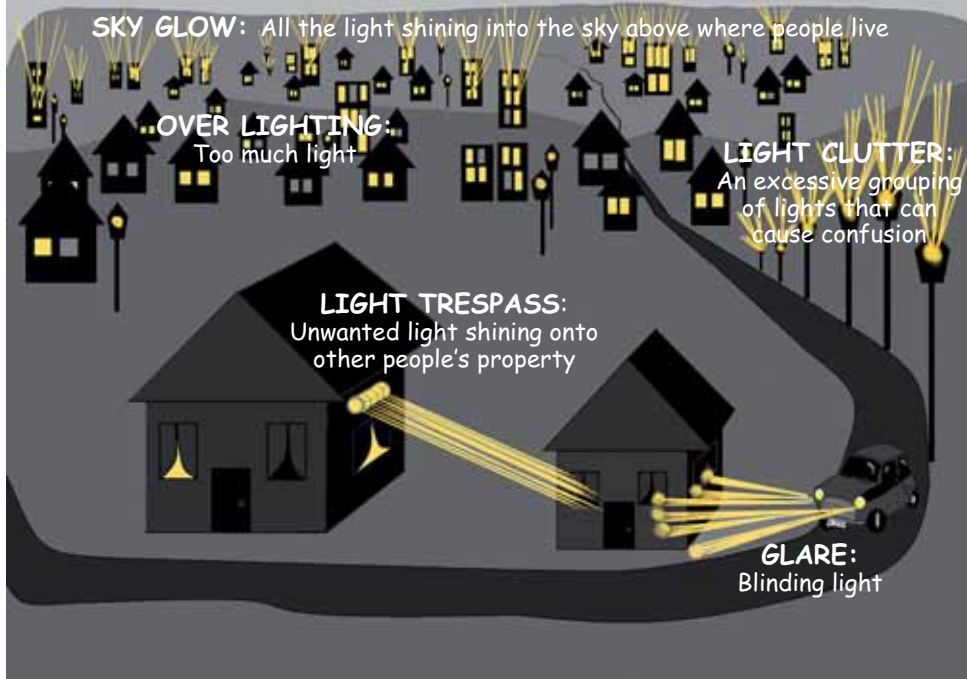
WHAT IS LIGHT POLLUTION?

Light pollution is the introduction of human-made light into the environment that has a negative impact. For example, maybe your neighbour has an outside light that shines directly through your bedroom window all night long, or office buildings or shops that leave their lights on all the time, even though there is no one there.

ACTIVITY: Study the drawing below to learn about the different types of light pollution. Then in the evening, go outside and do a lighting inventory of your house and community. Ask questions such as:

- Do you have a light on the outside of your house?
- How many?
- How long are they on for?
- Where do they shine?
- What are they used for?
- How about your neighbours?

If you discover that you have light pollution, you can take action to fix it!



Did you know? Many Namibians do not have access to electricity in rural areas. However, once people do have it, their outdoor light fixtures often cause light pollution. It doesn't have to be like this though as there are easy, inexpensive ways to make outdoor light fixtures which do not cause light pollution. See page 10 for "How to Shield Lights".

THE PROBLEMS WITH LIGHT POLLUTION

Like all pollution, light pollution harms the environment. It can be a problem on a very small local level (i.e. your neighbour's light shining into your bedroom) and on a large scale (i.e. large urban cities such as Johannesburg). Read on to find out how:



LOSS OF NIGHT SKY: In places where there is too much sky glow, people can no longer enjoy the true beauty of the night sky. With their naked eyes they can see less than 100 of the brighter stars, while from rural areas of Namibia thousands of stars can be seen.

LOSS OF OUR CULTURAL HERITAGE: The night sky is an important part of our culture and traditions. For centuries people have used stars and constellations to guide them. For example, the Southern Cross which directs us to the south. (See page 9.)

ENERGY WASTING: All this extra and inappropriate lighting is a huge waste of energy. More than 30% of electricity used to power outdoor lighting just goes into outer space.

INCREASED AIR POLLUTION: Most electricity produced worldwide comes from fossil fuels. This causes air pollution, especially CO₂ emissions. The wasted energy from light pollution is therefore also contributing to climate change.

REDUCED NIGHT VISION: It is commonly believed that night time outdoor lighting improves vision and reduces crime. Unfortunately this is not true. Incorrect lighting may actually aid criminal activities as the glare from bright lights makes it difficult to see criminals in the shadows.

DISTURBED ANIMAL LIFE: Animals (including humans) need to have night time. Night time lighting disturbs the sleep patterns, feeding behaviour, mating behaviour of many animals such as birds and insects.



All of these are also a **WASTE OF MONEY** because they:

- are expensive (i.e. energy wasting).
- are a loss of potential income (i.e. decrease in tourists).
- have additional known costs (i.e. increased crime).
- have additional unknown costs (i.e. changed behaviour of biodiversity).

TAKING ACTION: PROTECTING THE DARK SKY



How can we solve light pollution?

Easy, just turn off the lights!



It is almost that easy. If we did turn off all the lights the problem would be gone, but our way of life now depends on many of these lights. But, we can make adjustments to the lights and still have the light we need AND reduce light pollution! There are many people and organisations around the world working towards a "Dark Sky". One of these is the International Dark Sky Association.

INTERNATIONAL DARK SKY ASSOCIATION

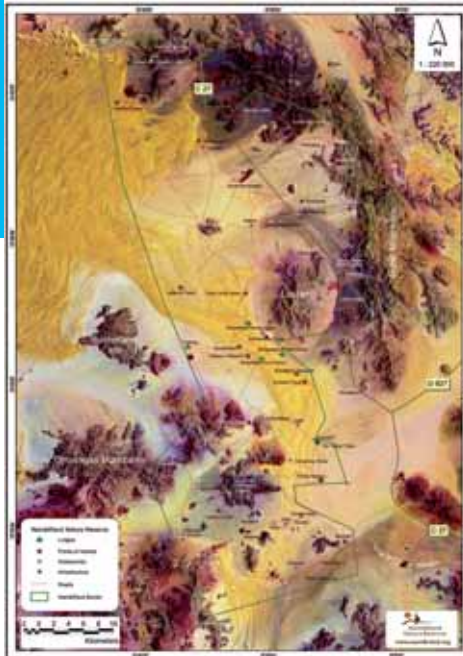
The International Dark Sky Association (IDA) aims to preserve and protect the night time environment and our heritage of dark skies through quality outdoor lighting. The IDA has more than 11,000 members in 75 countries. One of the activities of the IDA is to recognise and certify areas around the world that have preserved the dark sky. Find out more at www.darksky.org.

INTERNATIONAL DARK SKY RESERVE

An International Dark Sky Reserve (IDSR) is defined as "a public or private land possessing an exceptional or distinguished quality of starry nights and nocturnal environment". It must have at its core an area that is "specifically protected for its scientific, natural, educational, cultural, heritage and/ or public enjoyment". To date no IDSRs have been certified in Africa.

1ST AFRICAN IDSR: APPLICATION IN PROCESS...

An ideal location for Africa's first IDSR is the NamibRand Nature Reserve (NRNR) in southern Namibia. This privately-owned reserve is one of the largest in southern Africa and aims to maintain the unique environment of the Namib Desert. It shares a 100 km border with the Namib-Naukluft Park. Within the NRNR is NaDEET Centre which will serve as the IDSR's educational core, providing more than 1000 Namibians per year with a unique view of the night sky.



UN Decade of Education for Sustainable Development (DESD) 2005-2014 Through education and training, the reduction of light pollution can help us reach the goals of sustainable development worldwide. Through correct outdoor lighting, we can save energy, money and protect our natural heritage.

PERSONALITIES IN CONSERVATION

Name: Sonja Itting-Enke

Organisation: Cuno Hoffmeister Observatory

Number of years on the job:
since 1990

What is the Cuno-Hoffmeister Observatory?

is a privately operated observatory located 18 km south of Windhoek and the Auas Mountains next to the Harmony Seminary Centre. Its name is dedicated to the German astronomer, Cuno Hoffmeister, who took the first photographs of the Namibian sky during two trips in 1932-3 and 1952.



What is the main aim of the Observatory?

The main aim is to promote interest and knowledge about the Namibian night sky. The observatory works with the Namibian Scientific Society and with astronomers from around the world for their studies and work.

What is so special about Namibia's night sky?

Namibia's geographic location, on average only 22.75° from the Equator, is ideal to observe the entire southern night sky. From here, it is possible to see the whole central part of the Milky Way. Namibia also has very limited air and light pollution which is very important for observing the night sky.

What challenges does Namibia face to protect its night sky?

However, the expansion of urban areas is releasing more artificial light into the sky. This is, of course, resulting in increased light pollution. I try to address this threat by attending meetings regarding developments. I appeal to town planners to ensure that street lights are designed and installed with their light shining downwards, right from the development phase. It is important that they do not shine all over the area. This of course will also save energy and money.

What message do you have for Namibian youth?

The Namibian night sky is a precious jewel. It is interesting to learn about constellations and planets and with only basic knowledge everyone can actively participate in collecting data about the night sky. Learning is fun!

How can one visit?

Interested visitors including schools and other groups are welcome. Please make an appointment (Tel: 061-238982).



Example of bad installation of outdoor street lighting

TAKE A WALK THROUGH THE NIGHT SKY



Take a guided walk with us through the night sky and learn about the magic of our universe.

Use the key below to learn about each of the amazing constellations or objects in our night sky.



KEY

- = What is it?
- = How can I find it?
- = Meaning of name
- = Special objects that can be seen with a telescope/binoculars
- = Cultural information

MILKY WAY

The Milky Way is a spiral galaxy with about 100,000 million stars. It is about 100,000 light years across and 20,000 light years thick. It is like a giant disc, with a lump in the middle. All the stars that you can see are part of it. Our solar system is about halfway out of the edge to the disc.



Just look up. We are in the Milky Way. It looks like a long white streak across the sky.

Early stargazers thought it looked like a stream of milk.

Other names are "Road of Souls" and "Backbone of Night".

SMALL AND LARGE MAGELLANIC CLOUDS

The Small and Large Magellanic Clouds are actually other galaxies. They are classified as irregular, dwarf galaxies and are part of our "Local group" (see page 3). Both of them are much smaller than the Milky Way.

Look South for two fuzzy patches that look like small pieces of the Milky Way.

They are named after the explorer Magellan.

In Sotho folklore the clouds are said to be the tracks of two animals of the sky, the "Horn Star" and "Little Horn Star".

Near the Small Magellanic Cloud is 47 Tucanae. Located 16,000 light-years away, this globular cluster (a group of millions of stars) is part of our Milky Way Galaxy.



TAKE A WALK THROUGH THE NIGHT SKY

SOUTHERN CROSS (CRUX)

The Southern Cross is the most famous constellation in the Southern Hemisphere. It is made up of four stars. The long axis of the Southern Cross points to the South Celestial Pole (SCP).

It is visible every single night. Look for two stars Alpha and Beta Centauri (called the pointers) in the Milky Way. A line drawn from the brighter to the dimmer will lead to it.

This constellation together with the two pointers is also called the drinking giraffe.

To find true south

- 1) Draw an imaginary line through the long axis
- 2) Extend this line 4 1/2 times
- 3) This brings you to a point called the SCP.
- 4) Now, drop a vertical line to the horizon.



Next to the left star of the short axis is the "Jewel Box". This is a cluster of bright, multi-coloured stars.

SCORPIUS

Also called Scorpio, it has been seen by many cultures as representing a scorpion.

It is easily found in winter during the evening hours.

The star Antares is called by the San people "The Fire-Finishing Star" because it often sets late and is bright and reddish.



ORION

Orion is one of the most well-known constellations. It contains two very bright stars, reddish Betelgeuse and blueish-white Rigel. It has three stars between them called "the belt".

It is easily found in summer during the evening hours.

Greek mythology gave it the name Orion, the hunter.

This constellation has many stories surrounding it. San folklore says that the "belt" is actually three eland walking towards a waterhole (Sirius-the brightest star in the sky). The "sword" is the San's arrow that missed the Eland. The legs and arms of "Orion" are the dunes behind which the San are hiding.

Located among the stars of the sword is a fuzzy patch called the Orion Nebula. This is a region of our galaxy where new stars are forming from a huge cloud of gas and dust.



TAKE ACTION: SHIELD YOUR LIGHTS

It is easy to reduce light pollution at your own home or workplace. Do a check to see which lights are shining in the wrong directions or are too bright. Use this low cost, easy step-by-step guide to shield outdoor lights on your property.
BE CAREFUL, AS MANY EDGES CAN BE SHARP!

Step 1



STEP 1: Identify problem lights. Although this light is under a roof, it has no cover. Most of the light it produces is wasted and shines in the wrong direction.



STEP 2: Collect materials (many different recycled materials can be used) needed to make a shield. In this guide, we have used a large coffee tin, tin opener, metal shears, hammer, nail, wire, screwdriver and screws. However you can easily adapt the design.

Step 3



STEP 3: Use the tin opener to remove the lip on the tin.

Step 4



STEP 4: Cut a hole in the bottom that is just large enough for the light fitting. Puncture two holes for screws for mounting later.

Step 5



STEP 5: Using the metal shears, first cut the tin to create an opening for the light that you do want. Then attach a shield using wire to block outward going light.

Step 6



STEP 6: Mount the shield onto the wall using screws. Use an energy saving light bulb that is no more than 11 Watts.



Dear friends,

We love answering your questions about the environment.

If you have any, send them to:
Chinga & Nzovu, NaDEET, PO Box 31017, Pioniers Park, Windhoek

Dear Chinga and NZOVU,
 Does mining produce dust? If yes, how does it affect local towns?

From Hilma in Henties Bay

Dear Hilma,

Yes, uranium mining produces dust. Open-pit uranium mining brings ore to the surface, crushes it, extracts the uranium and returns the "waste" to the ground. All of these actions cause dust. A lot of dust in the air is harmful to all living things, especially from uranium mining since it contains radioactive particles. This affects the workers at the mine and surrounding towns such as Walvis Bay, Swakopmund and Arandis. All living things, including us, can experience negative health effects. Increased dust in the air from mining and any other industry will also affect our unique dark sky. It will make the sky hazy and it will no longer be possible to see the beautiful night sky so clearly.



Chinga and Nzovu

CONTEST! TELL US... CONTEST!

You know that sometimes we have a moon and sometimes we don't. Well, in Nyemba culture we say that this is because the moon is a man with two wives - a nice wife and a jealous wife. Whenever there is no moon the jealous wife has killed him. The nice wife must then do anything that she can to get him back. Luckily she is successful and there once again is a full moon.

....YOUR OWN STORY OF THE MOON AND WIN!

Do you know a story about the moon? It can be a traditional, cultural or your own story about the moon. Write it down and post, fax or email it to us by **1 December 2011** and **WIN** glow-in-the-dark night sky stickers and a stargazing guide.

Make sure to include your name, age and postal address. Send entries to:
NaDEET, address on back cover.

1st place winner: Eco Media Awards "Publishers House" category 2010

Official youth magazine of the Roan News

Writer: Viktoria Keding ~ **Editing:** Dr. George Tucker

Graphics: L. Pietrasch, G. Tucker, D. Heinrich, S. Kardel/Palomar Observatory, NRNR and NaDEET Photo Library

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Tel: 063-693012 Fax: 063-693013 Email: admin@nadeet.org Web: www.nadeet.org
NaDEET Centre offers week-long programmes for school, youth, educator & adult groups in the Namib Desert.

Join the BUSH TELEGRAPH Reader Club



The Bush Telegraph is a mini-magazine for Namibian youth. It aims to increase knowledge of and improve attitudes towards our environment through reading. It is distributed twice a year for free. Just fill in this form and send it to this address: **Namib Desert Environmental Education Trust (NaDEET), P.O. Box 31017, Pioniers Park, Windhoek**



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