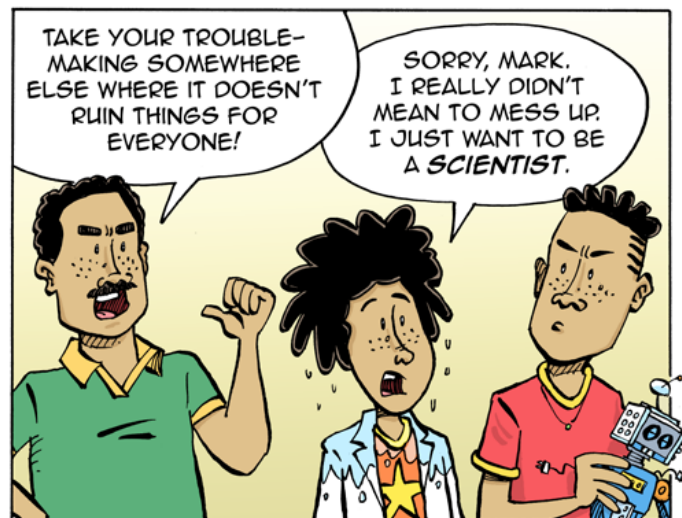
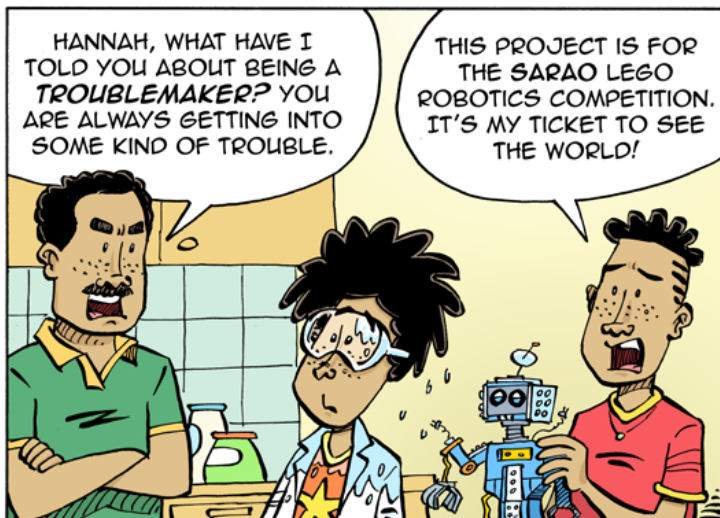
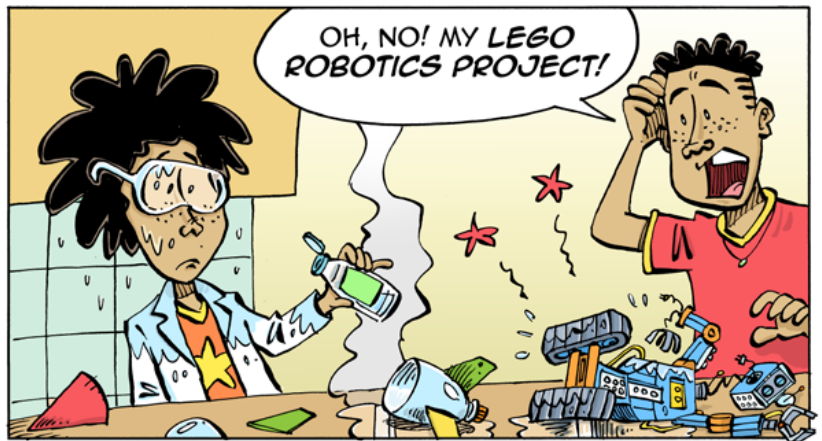
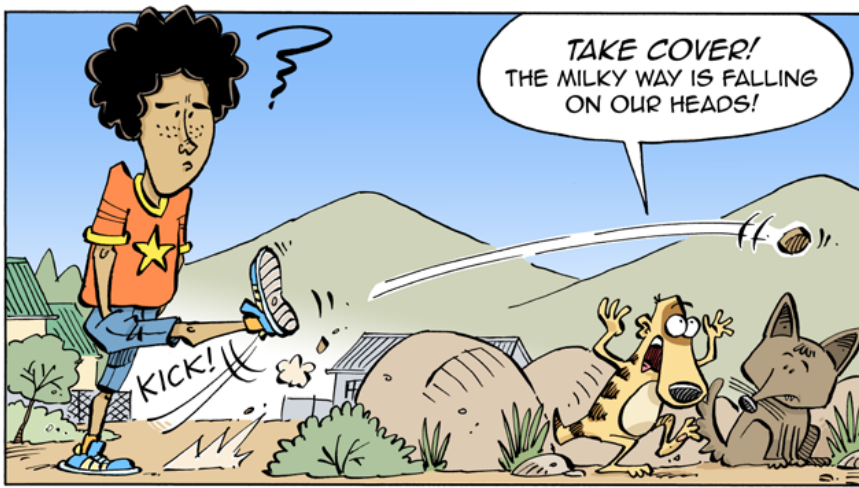


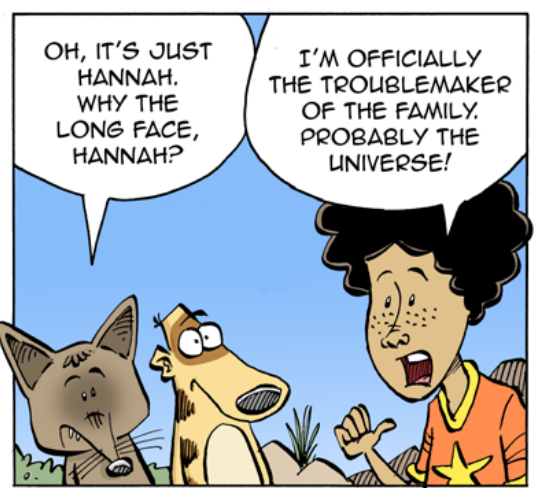
MISSION MEERKAT No. 6

INKATHAZO: HANNAH AND THE TROUBLEMAKER GALAXY



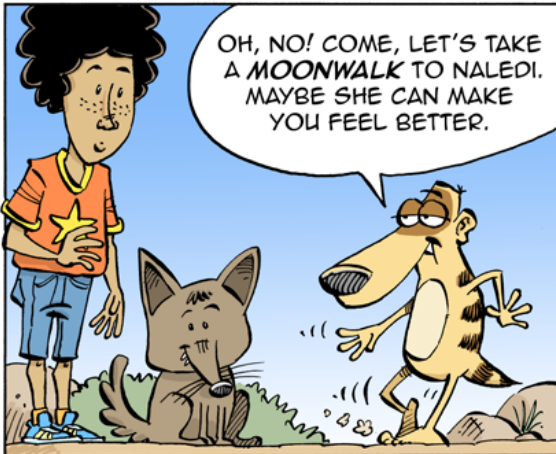


TAKE COVER!
THE MILKY WAY IS FALLING
ON OUR HEADS!

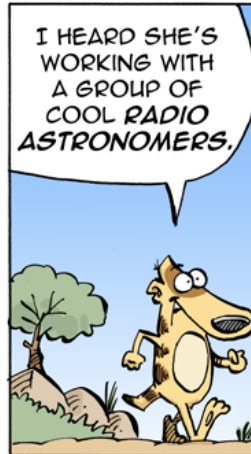


OH, IT'S JUST
HANNAH.
WHY THE
LONG FACE,
HANNAH?

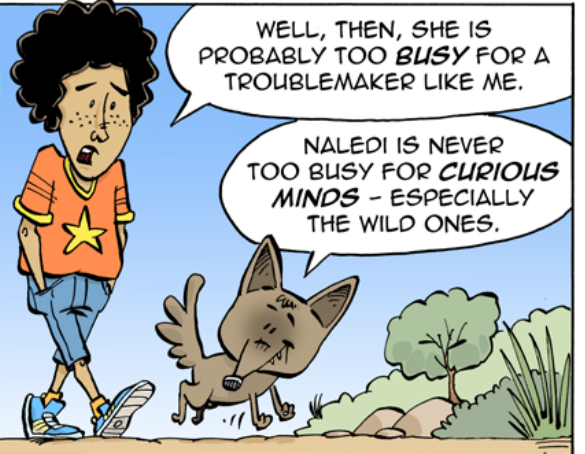
I'M OFFICIALLY
THE TROUBLEMAKER
OF THE FAMILY.
PROBABLY THE
UNIVERSE!



OH, NO! COME, LET'S TAKE
A MOONWALK TO NALEDI.
MAYBE SHE CAN MAKE
YOU FEEL BETTER.

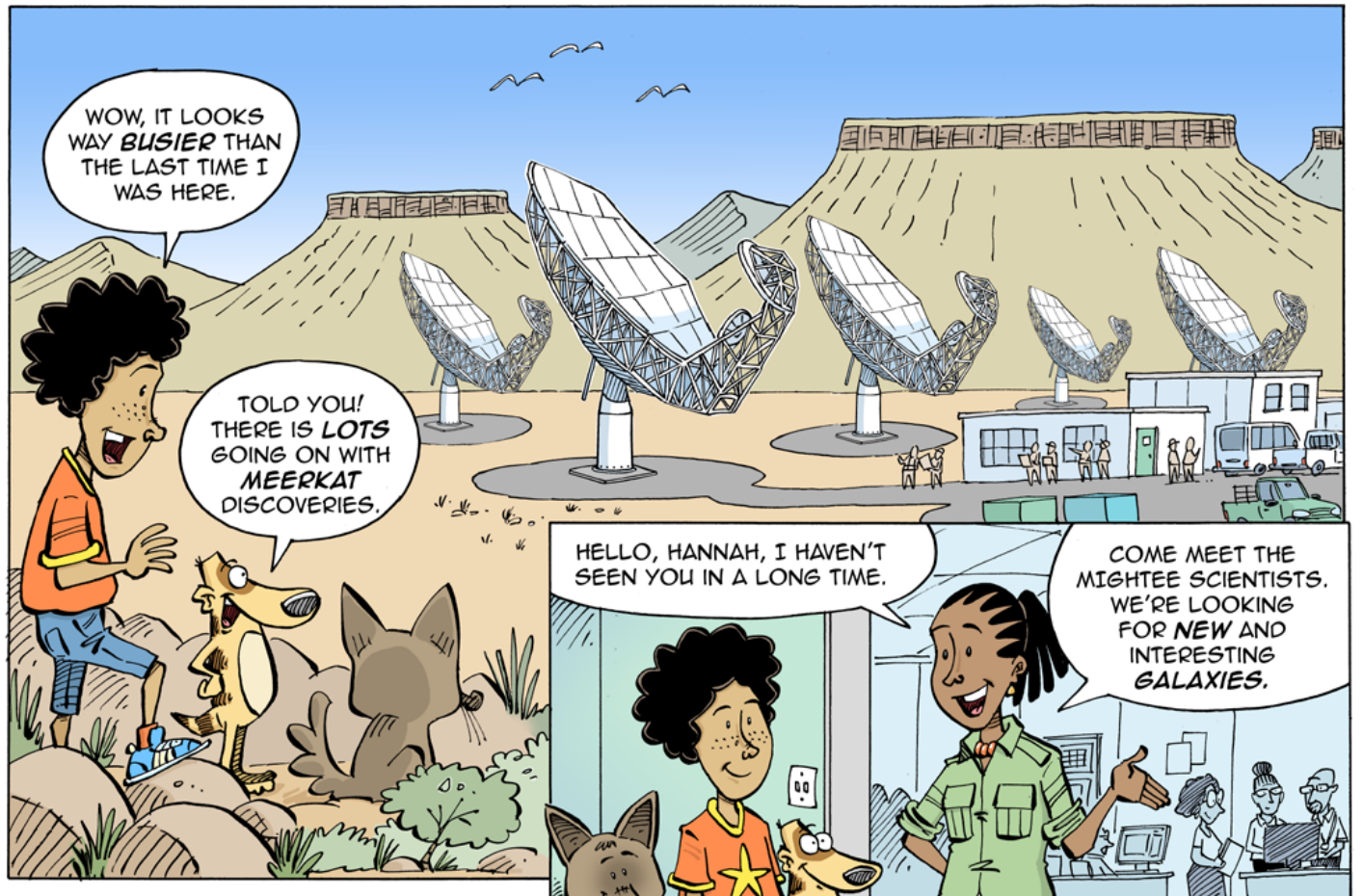


I HEARD SHE'S
WORKING WITH
A GROUP OF
COOL RADIO
ASTRONOMERS.



WELL, THEN, SHE IS
PROBABLY TOO *BUSY* FOR A
TROUBLEMAKER LIKE ME.

NALEDI IS NEVER
TOO BUSY FOR *CURIOUS
MINDS* - ESPECIALLY
THE WILD ONES.



WOW, IT LOOKS
WAY *BUSIER* THAN
THE LAST TIME I
WAS HERE.

TOLD YOU!
THERE IS LOTS
GOING ON WITH
MEERKAT
DISCOVERIES.

HELLO, HANNAH, I HAVEN'T
SEEN YOU IN A LONG TIME.

COME MEET THE
MIGHTEE SCIENTISTS.
WE'RE LOOKING
FOR NEW AND
INTERESTING
GALAXIES.

WOW! **SCIENTISTS** FROM ALL OVER THE **WORLD** ARE WORKING WITH SOUTH AFRICAN RADIO ASTRONOMERS RIGHT HERE IN THE KAROO! **MEERKAT IS WORLD-FAMOUS!**

NEW GALAXIES?
HAVE THEY
JUST FORMED
IN OUR
UNIVERSE,
LIKE NOW?

WELL, ACTUALLY, THESE GALAXIES, WHICH ARE MADE UP OF BILLIONS AND BILLIONS OF STARS, HAVE BEEN AROUND FOR BILLIONS OF YEARS, AND THE STARS IN THE GALAXIES HAVE BEEN EMITTING RADIO WAVES INTO THE UNIVERSE ALL ALONG. BUT WE ARE ONLY NOW ABLE TO DETECT THEM BECAUSE OF MEERKAT'S POWERFUL ENGINEERING ABILITIES. SO, THEY'RE VERY NEW TO HUMANS, EVEN THOUGH THEY WERE HERE LONG BEFORE THERE WAS EVEN LIFE ON THE PLANET.

YES, AND THAT IS HOW WE FOUND A NEW GALAXY NAMED **INKATHAZO**, WHICH IS THE ZULU AND XHOSA WORD FOR **TROUBLE...**

...AND IT
SURE IS GIVING
US TROUBLE,
BUT IN A **GOOD**
WAY!

THE **INKATHAZO GALAXY** IS **BREAKING ALL THE RULES** WE THOUGHT WE KNEW ABOUT GALAXIES!

ALL RADIO GALAXIES PRODUCE **JETS OF PLASMA** FROM THE BLACK HOLE AT THEIR CENTRE, WHICH EXTEND STRAIGHT ACROSS THE GALAXY. BUT **INKATHAZO'S JETS ARE CURVED!**

ALSO, **INKATHAZO** LIVES AT THE VERY CENTRE OF A CLUSTER OF GALAXIES, RATHER THAN ALONE - AND THIS SHOULD MAKE IT DIFFICULT FOR THE PLASMA JETS TO GROW TO SUCH ENORMOUS SIZES, YET EACH JET IS ABOUT **3,3 MILLION LIGHT-YEARS ACROSS.**

WHICH **OBSERVATORY** DO YOU WORK FOR?

I AM ACTUALLY A MASTER'S STUDENT AT UNIVERSITY. I LEAD THE **RESEARCH ON INKATHAZO.**

WOW.

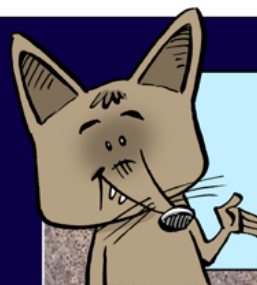
SEE, HANNAH. MAYBE SOON YOU CAN ALSO FIND **TROUBLE** IN THE UNIVERSE.

TROUBLE IN THE UNIVERSE? SOUNDS LIKE MY KIND OF SCIENCE.

ALRIGHT, LET'S DO IT. TIME TO **LAUNCH** THIS THING.

CAPTAIN HANNAH! PREPARE FOR **LIFT-OFF!** THE **INKATHAZO GALAXY** AWAITS!

WE'RE CLEARING THE LAUNCH PAD IN ...3...2...1... **LIFT-OFF!**



MEERKAT'S SIXTY-FOUR ANTENNAS ARE CONNECTED TO EACH OTHER TO INCREASE THE DATA-COLLECTING AREA. COMBINING SIGNALS FROM ALL THE ANTENNAS MAXIMISES MEERKAT'S SENSITIVITY AND RESOLUTION, AND THAT IS WHY WE CAN PRODUCE SUCH DETAILED IMAGES FROM THE DATA COLLECTED BY MEERKAT.



HMM... THAT'S JUST LIKE ME AND MY FAMILY ON LOOKOUT!



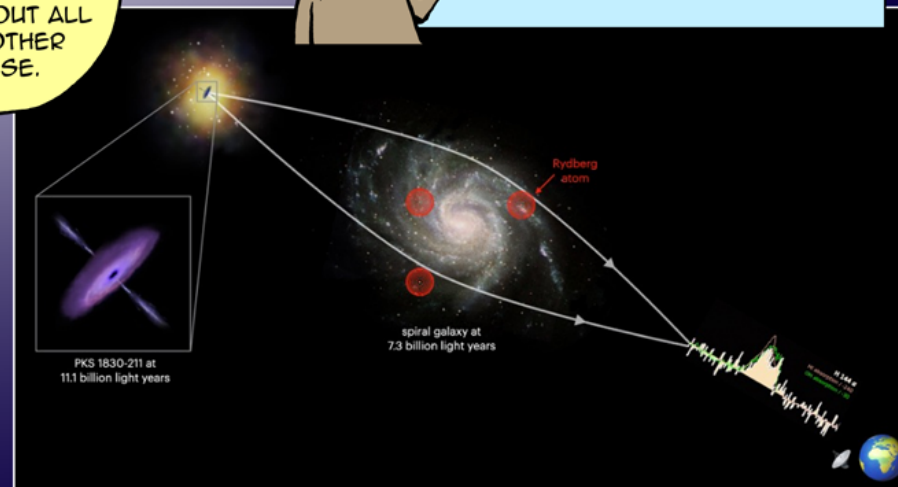
IN ADDITION, MEERKAT'S INNOVATIVE TECHNOLOGY, TOGETHER WITH ITS REMOTE LOCATION IN THE KAROO, REDUCES THE CHANCES OF THE ANTENNAS COLLECTING SIGNALS FROM MAN-MADE RADIO DEVICES (WHICH ALSO PRODUCE RADIO WAVES) LIKE CELL PHONES, RATHER THAN THE SIGNALS PRODUCED BY OBJECTS IN THE UNIVERSE. IN RADIO ASTRONOMY, IT IS NOT LIGHT THAT AFFECTS OUR ABILITY TO OBSERVE THE UNIVERSE, BUT RADIO FREQUENCY INTERFERENCE (RFI).



AND THAT'S JUST LIKE MY BIG EARS, WHICH HONE IN ON JUICY BUGS AND FILTER OUT ALL THE OTHER NOISE.



MEERKAT'S DISCOVERIES HAVE SURPASSED ALL EXPECTATIONS. FOR EXAMPLE, MEERKAT HAS REVEALED X-SHAPED GALAXIES AND RYDBERG ATOMS! THESE ARE MUCH BIGGER THAN THE ATOMS WE HAVE HERE ON EARTH - SO THEY'RE PERFECT FOR STUDYING SPACE GAS.

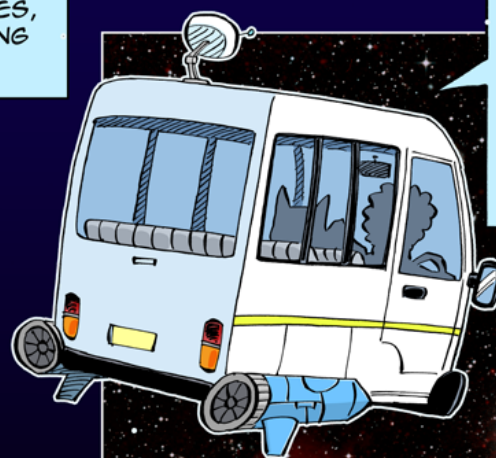


WHAT ARE X-SHAPED GALAXIES?

THEY'RE A BIT OF A MYSTERY! MOST GALAXIES WITH BLACK HOLES SHOOT OUT TWO GIANT JETS OF ENERGY IN A STRAIGHT LINE, BUT X-SHAPED GALAXIES HAVE TWO EXTRA LOBES. SCIENTISTS THINK THIS MIGHT HAPPEN WHEN TWO GALAXIES, AND THEIR BLACK HOLES, INTERACT - BENDING THEIR JETS INTO A BIG X IN SPACE.



AND IT'S ONLY THE BEGINNING: SEE THOSE BRIGHT JETS STREAMING OUT FROM THE BLACK HOLE AT THE CENTRE OF GALAXY IC 4296? THEY'RE BLASTS OF ENERGY THAT HAVE BEEN TRAVELING THROUGH SPACE FOR 160 MILLION YEARS! THAT'S LONG BEFORE DINOSAURS ROAMED THE EARTH, AND WAY BEFORE HUMANS SHOWED UP.

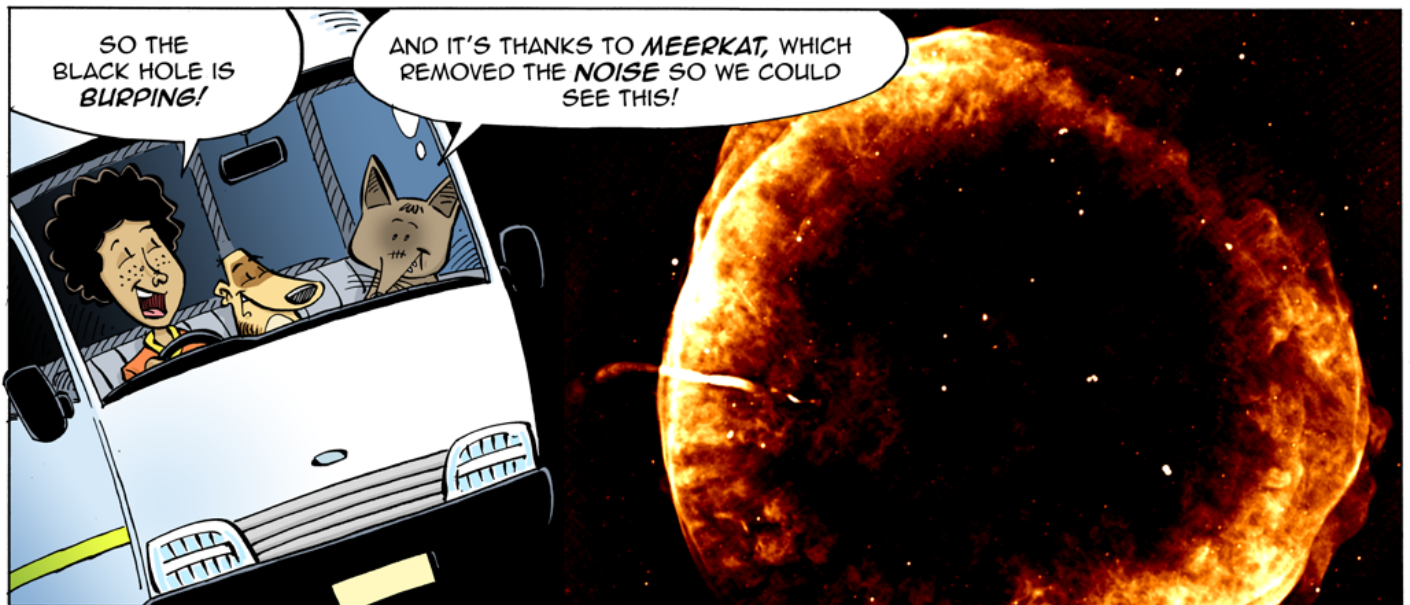
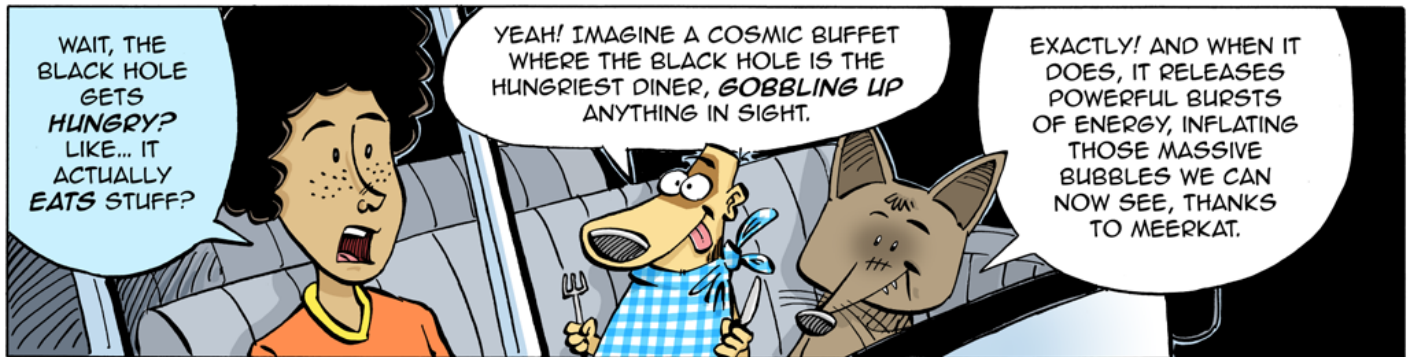
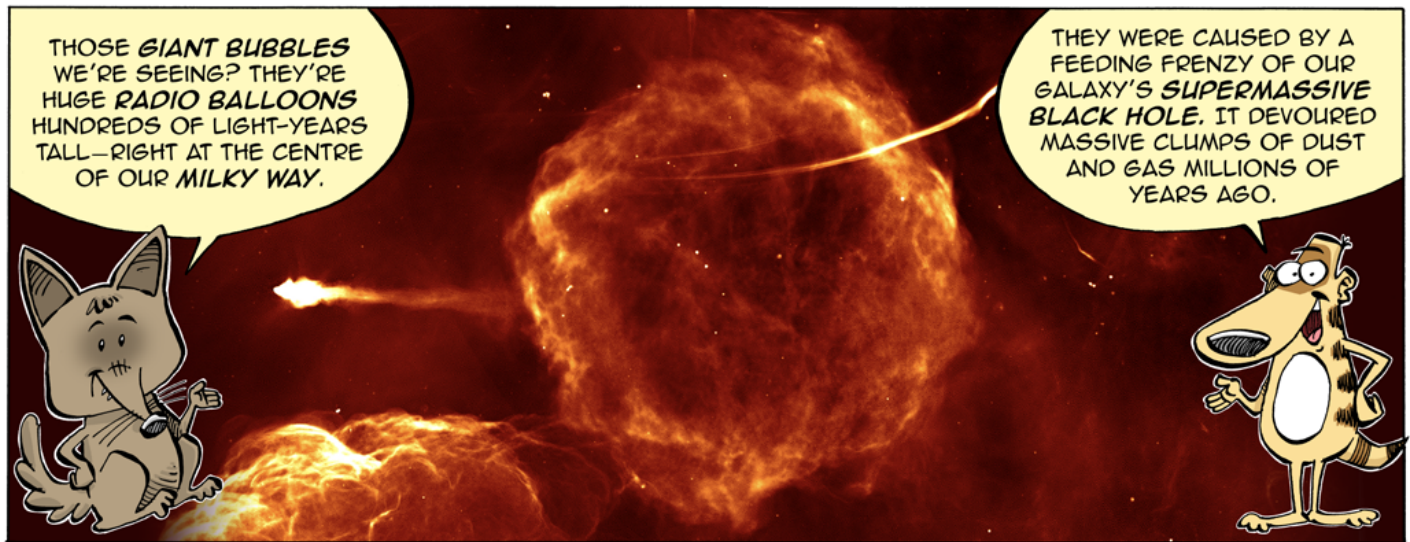


AND IT GETS BETTER - SOME OF THOSE JETS' ELECTRONS ESCAPE TO FORM FAINT RADIO THREADS. THEN SMOOTH RIBBONS FILL CHANNELS CARVED FROM OLD JETS, AND OUT AT THE EDGES ARE GIANT COSMIC SMOKE RINGS, NEARLY A MILLION LIGHT-YEARS AWAY - TEN TIMES THE DIAMETER OF OUR WHOLE MILKY WAY!

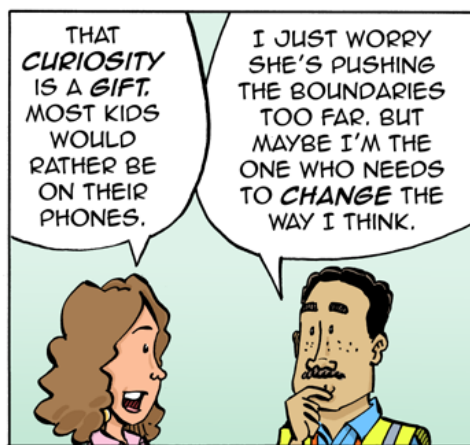
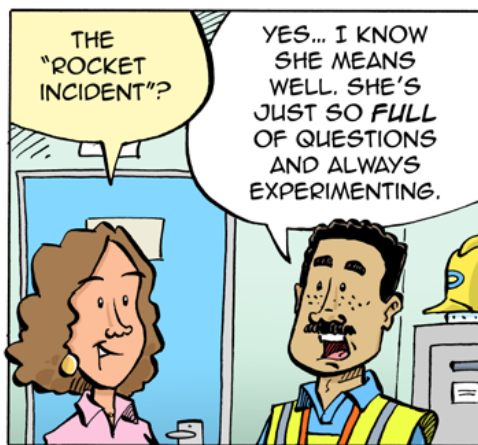


THREADS, RIBBONS, SMOKE RINGS... NON-STOP FIREWORKS FOR MILLIONS OF YEARS... NOW THAT'S WHAT I CALL A SPACE PARTY!

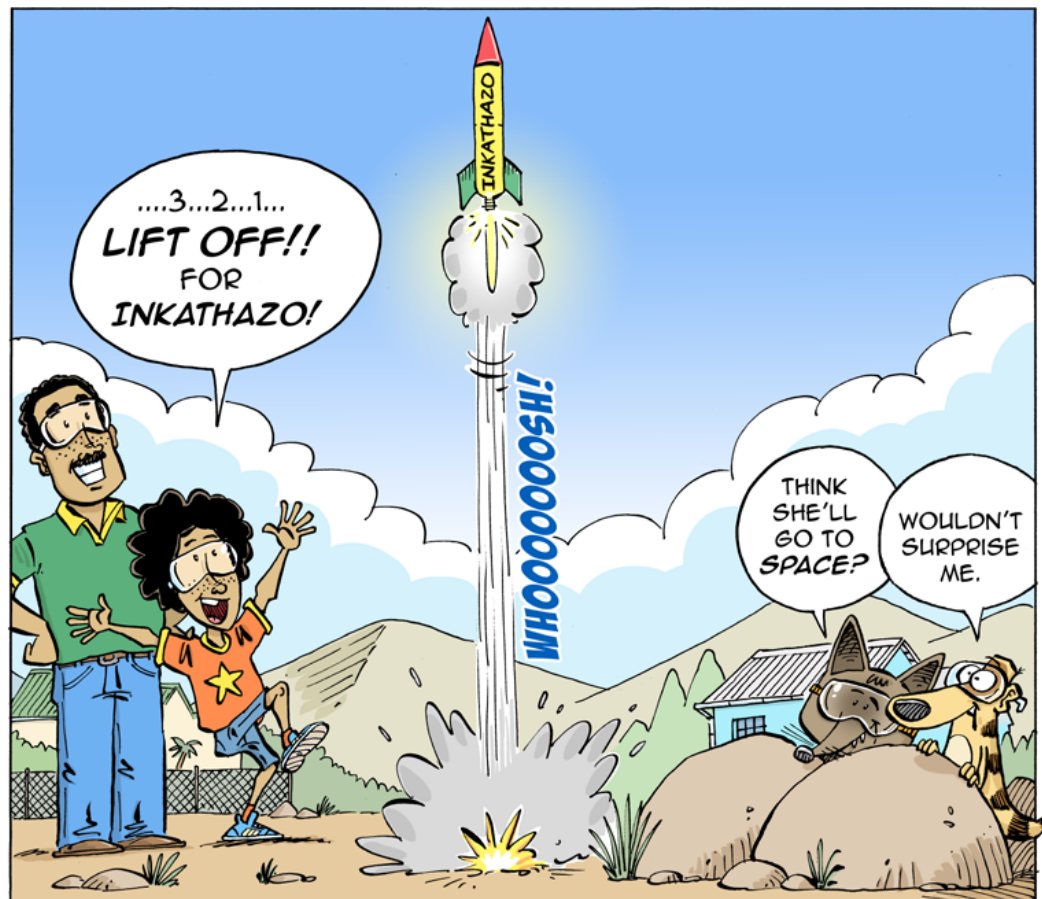








A FEW WEEKS LATER...



"Mission MeerKAT" is brought to you by the South African Radio Astronomy Observatory (SARAO), which includes the MeerKAT project. For more information, visit www.sarao.ac.za or contact the SARAO office in Cape Town on +27 (0) 21 506 7300. These radio astronomy projects are managed by the South African Department of Science, Technology and Innovation, via the National Research Foundation (NRF). The project is being developed in close cooperation with the Northern Cape Province and the local authorities in Carnarvon and Williston. Night sky pictures courtesy of NASA. Produced by Jive Media – www.jivemedia.co.za. All rights reserved.