

STAR GAZERS

SG 1539 – 5 MINUTE

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SEPT. 28 – OCT 4, 2015

“CYGNUS THE  
SPECTACULAR SWAN!”

DEAN: WELCOME TO STAR  
GAZERS. I'M DEAN REGAS,  
ASTRONOMER FROM THE  
CINCINNATI  
OBSERVATORY.

JAMES: AND I'M JAMES  
ALBURY, DIRECTOR OF  
THE KIKA SILVA PLA  
PLANETARIUM IN  
GAINESVILLE FLORIDA.  
NOW THAT AUTUMN HAS  
BEGUN IN THE NORTHERN  
HEMISPHERE, IT'S TIME TO  
SAY FAREWELL TO THE  
CONSTELLATIONS THAT  
KEPT US COMPANY ALL  
SUMMER LONG.

DEAN: THAT'S RIGHT,  
JAMES AND ONE OF THE  
MOST BELOVED OF THESE  
CONSTELLATIONS IS  
CYGNUS THE SWAN. EVEN  
FROM BRIGHTLY LIT

CITIES, THIS IS A  
CONSTELLATION THAT'S  
EASY TO FIND. BUT, DID  
YOU KNOW THAT CYGNUS  
HAS BOTH A POETIC AND A  
SCIENTIFIC HISTORY THAT  
RIVALS MANY OF THE  
CONSTELLATIONS WE CAN  
SEE?

JAMES: LET'S SHOW YOU.

(STOP & DROP)

DEAN: OK, WE HAVE OUR  
SKIES SET FOR JUST  
AFTER SUNSET ANY NIGHT  
THIS WEEK. ALMOST  
DIRECTLY OVERHEAD,  
YOU CAN SEE THE  
FAMILIAR STARS OF THE  
SUMMER TRIANGLE.  
VEGA, THE BRIGHTEST  
STAR IN LYRA THE HARP,  
ALTAIR, THE BRIGHTEST  
STAR IN AQUILA THE  
EAGLE AND DENEK THE  
BRIGHTEST STAR IN  
CYGNUS THE SWAN.  
CYGNUS THE SWAN HAS  
BEEN AN AREA OF  
FASCINATION FOR STORY

TELLERS AND  
ASTRONOMERS ALIKE FOR  
THOUSANDS OF YEARS.

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JAMES: TO FIND THE  
SWAN, SIMPLY DRAW A  
LINE FROM DENEK  
INWARD TOWARD THE  
CENTER OF THE SUMMER  
TRIANGLE. THE FIRST  
STAR YOU'LL ENCOUNTER  
IS SADR (ALSO KNOWN AS  
GAMMA CYGNI). THIS  
MARKS THE HEART OF THE  
SWAN. THEN IF YOU DRAW  
LINES TO THE WEST AND  
EAST OF THIS STAR,  
YOU'LL FIND TWO MORE  
STARS (ETA AND OMICRON  
CYGNI). THESE MARK THE  
RIGHT AND LEFT WINGS  
OF THE SWAN. GOING  
BACK TO THE STAR SADR,  
WE CONTINUE TO DRAW A  
LINE INWARD TO FORM  
THE NECK OF THE SWAN,  
ENDING AT THE STAR  
ALBIREO.

DEAN: IN ONE LEGEND,  
CYGNUS THE SWAN IS  
SAID TO BE THE GREAT  
MUSICIAN ORPHEUS WHO  
WAS TRANSFORMED INTO  
A SWAN, AND PLACED IN  
THE SKY NEXT TO HIS  
HARP, THE  
CONSTELLATION, LYRA.

JAMES: IN ANOTHER  
LEGEND, CYGNUS IS SAID  
TO BE ZEUS, WHEN HE  
TRANSFORMED HIMSELF  
INTO A SWAN TO SEDUCE  
LEDA, THE QUEEN OF  
SPARTA, WHO ALSO  
HAPPENED TO BE THE  
MOTHER OF HELEN OF  
TROY, CLYTEMNESTRA  
AND THE GEMINI TWINS,  
CASTOR AND POLLUX.

DEAN: HOWEVER, IN  
MODERN TIMES, CYGNUS  
HAS TURNED OUT TO BE A  
PLACE OF GREAT  
DISCOVERIES.

(STOP & DROP)

JAMES: DURING A ROCKET FLIGHT IN 1964, A GALACTIC X-RAY SOURCE KNOWN AS CYGNUS X-1 WAS DISCOVERED. CYGNUS X-1 IS NOW WIDELY ACCEPTED TO BE A CANDIDATE FOR THE FIRST BLACK HOLE WE'VE DISCOVERED AND IT'S ESTIMATED TO HAVE A MASS ALMOST 15 TIMES THE MASS OF OUR SUN, YET AN EVENT HORIZON RADIUS OF ONLY ABOUT 16 MILES.

DEAN: IN MORE RECENT TIMES, CYGNUS HAS BEEN THE TARGET OF STUDY BY NASA'S KEPLER SPACE TELESCOPE. THE KEPLER TELESCOPE STUDIED OVER 100,000 STARS IN CYGNUS. ITS GOAL WAS TO FIND PLANETS ORBITING OTHER STARS, AND SINCE ITS MISSION BEGAN, SEVERAL OF

THESE EXTRA-SOLAR  
PLANETS HAVE BEEN  
DISCOVERED AND  
CONFIRMED. THE PLANET  
KEPLER- 22B WAS  
ANNOUNCED AS BEING  
THE FIRST "EARTH-LIKE"  
PLANET ORBITING A SUN-  
LIKE STAR.

JAMES: KEPLER 22-B IS  
OVER 600 LIGHT YEARS  
AWAY AND ORBITS IN THE  
HABITABLE ZONE WHERE  
LIQUID WATER CAN EXIST.  
WITH A POSSIBLE  
SURFACE TEMPERATURE  
NEAR 73 DEGREES  
FAHRENHEIT, KEPLER-22B  
IS QUITE THE  
"GOLDILOCKS PLANET", IF I  
DO SAY SO MYSELF.

(STOP – CLOSE UP)

JAMES: AND SPEAKING OF  
PLANETS, IF YOU EVER  
GET LOST ON MARS,  
DENEK IS THE NORTH  
STAR ON MARS. WE  
NEVER REALLY THINK  
ABOUT IT, BUT EACH OF

THE PLANETS HAS A  
DIFFERENT NORTH STAR  
OR HAS NO NORTH STAR  
AT ALL.

DEAN: ALL THE PLANETS  
IN OUR SOLAR SYSTEM  
ROTATE ON AN AXIS. THE  
DIRECTION THE AXIS  
POINTS WITH RESPECT TO  
THE PLANE OF THE SOLAR  
SYSTEM DETERMINES THE  
ANGLE OF AXIAL TILT.  
OUR EARTH IS TILTED 23.5  
DEGREES WITH RESPECT  
TO THE PLANE OF OUR  
SOLAR SYSTEM. MARS  
TILTS AT 25 DEGREES  
AND SATURN HAS A TILT  
OF ALMOST 27 DEGREES.

JAMES: HOWEVER,  
COMPARE THAT WITH  
MERCURY AND JUPITER,  
WHICH BARELY TILT AT  
ALL; BETWEEN 2 AND 3  
DEGREES RESPECTIVELY.  
YET AT THE OTHER  
EXTREME YOU HAVE  
VENUS, WHICH IS  
PRACTICALLY UPSIDE

DOWN AT 177 DEGREES  
AND URANUS WHICH LIES  
ON ITS SIDE AT 98  
DEGREES.

DEAN: SO SINCE EVERY  
PLANET TILTS IN A  
DIFFERENT DIRECTION,  
EACH PLANET SHOULD  
HAVE A DIFFERENT NORTH  
STAR; OR, NO NORTH  
STAR AT ALL. SO THAT'S  
WHY OUR NORTH POLE IS  
POINTING NEAR POLARIS,  
AND MARS IS POINTING  
NEAR DENEK.

JAMES: SO, IF YOU EVER  
GET LOST ON MARS, LOOK  
FOR CYGNUS THE SWAN  
(ALSO KNOWN OF THE  
NORTHERN CROSS) AND  
YOU'LL FIND NORTH.

DEAN: SO THERE YOU  
HAVE IT, THE  
SPECTACULAR  
CONSTELLATION CYGNUS  
THE SWAN. AND IT'S ALL  
UP THERE FOR YOU TO  
SEE IF YOU REMEMBER  
TO...



BOTH: KEEP LOOKING UP!