

STAR GAZERS  
SG 1704 - 5M  
JANUARY 23-29, 2017

"THE GREAT ORION NEBULA"

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

**JAMES:** AND I'M JAMES ALBURY, DIRECTOR OF THE KIKI SILVA PLA PLANETARIUM IN GAINESVILLE FLORIDA. WE'RE HERE TO HELP YOU FIND YOUR WAY AROUND THE SKY.

**DEAN:** ONE OF THE BEST THINGS ABOUT WINTER IS THAT IT ALWAYS BRINGS THE RETURN OF ONE OF THE TRUE WONDERS OF THE UNIVERSE.

**JAMES:** THAT WOULDN'T BE SNOW, WOULD IT?

**DEAN:** NOT QUITE, JAMES! BUT IT'S SOMETHING THAT IS VERY EASY TO SPOT IN THE WINTER SKY. AN OBJECT IN DEEP SPACE!

**JAMES:** SWEET! LET'S SHOW YOU!

----(STOP)

**DEAN:** WE HAVE OUR SKIES SET UP FOR ANY NIGHT THIS WEEK AT ABOUT 7:30PM. IN THE SOUTHEAST YOU'LL SEE WHAT HAS TO BE THE SECOND MOST FAMILIAR PATTERN OF STARS (AFTER THE BIG DIPPER THAT IS), A PATTERN WHICH IS LOADED WITH BRIGHT STARS, KNOWN AS ORION THE HUNTER.

**JAMES:** TO FIND HIM LOOK FOR HIS BELT OF THREE STARS IN A ROW. THESE ARE THE STARS, ALNITAK, ALNILAM AND MINTAKA.

**DEAN:** ABOVE THESE 3 BELT STARS YOU'LL SEE 2 BRILLIANT STARS MARKING ORION'S SHOULDERS, BETELGEUSE AND BELLATRIX. AND BELOW HIS BELT, 2 OTHER STARS MARK HIS ANKLE AND HIS KNEE, RIGEL AND SAIPH.

**JAMES:** WE OFTEN TALK ABOUT ORION'S BRIGHT STARS, BUT FOR THIS EPISODE, WE WOULD LIKE TO ZERO-IN ON ONE OF ORION'S MORE SUBTLE OBJECTS. LOOK BELOW THE BELT STARS FOR 3 MUCH DIMMER STARS, THE STARS WE CALL THE SWORD OF ORION. THERE WE WILL FIND ONE OF THE MOST AWESOME WONDERS OF OUR NEARBY UNIVERSE.

---(STOP & FLY) (BETTER ANGLED BACKGROUND AND SLIGHTLY SHARPER INSETS NEEDED)

**DEAN:** IF YOU LOOK VERY CAREFULLY AT THESE 3 STARS YOU'LL NOTICE THAT NO MATTER HOW SHARP YOUR EYESIGHT, THE MIDDLE STAR ALWAYS SEEMS TO LOOK FUZZY OR SLIGHTLY OUT OF FOCUS AND THAT'S BECAUSE THIS STAR IS NOT A STAR AT ALL, BUT SOMETHING WE CALL A NEBULA.

**JAMES:** A NEBULA IS A COSMIC CLOUD OF GAS AND DUST AND THE GREAT NEBULA OF ORION IS ACTUALLY A STELLAR RECYCLING CENTER. WITHIN THIS NEBULA, BRAND NEW STARS HAVE BEEN, AND ARE STILL BEING BORN FROM THE SURROUNDING CLOUD.

**DEAN:** IN FACT, YOU CAN SEE THIS NEBULA USING EVEN THE CHEAPEST PAIR OF BINOCULARS. THIS CLOUD IS ILLUMINATED BY 4 RECENTLY-BORN STARS ARRANGED IN THE SHAPE OF A BASEBALL DIAMOND CALLED THE TRAPEZIUM, AND THESE 4 STARS CAN

ACTUALLY BE SEEN WITH A SMALL TELESCOPE. NOW, ALTHOUGH THE ORION NEBULA LOOKS TINY, IN REALITY, ITS SIZE IS MIND-BOGGLING.

----(STOP & FLY IN SPACE) (ADD TITLE ORION NEBULA)

**DEAN:** BELIEVE IT OR NOT, THERE IS ENOUGH MATERIAL IN THIS NEBULA TO PRODUCE OVER 10 THOUSAND STARS THE SIZE OF OUR SUN! BUT IF YOU REALLY WANT TO BE IMPRESSED, CHECK OUT THE WIDTH OF THE ORION NEBULA. AS NEBULAE GO, THIS ONE IS GIGANTIC; SPANNING OVER 30 LIGHT YEARS IN DIAMETER.

----(STOP)

**JAMES:** JUST TO GIVE YOU A REFRESHER, A LIGHT YEAR IS NOT A MEASURE OF TIME, BUT A MEASURE OF DISTANCE. SPACE IS SO BIG AND THE STARS ARE SO FAR AWAY, THAT WE ASTRONOMERS DON'T MEASURE THE DISTANCES BETWEEN THE STARS IN TERRESTRIAL UNITS LIKE MILES OR KILOMETERS. WE USE THE TERM LIGHT YEAR.

**DEAN:** LIGHT TRAVELS AT A WHOPPING 186,000 MILES PER SECOND, WHICH IS ALMOST 670 MILLION MILES PER HOUR! THIS MEANS THAT IF YOU WERE TO TRAVEL AT THE SPEED OF LIGHT FROM THE EARTH TO THE MOON, YOU COULD MAKE THE TRIP IN A LITTLE LESS THAN TWO SECONDS. IF YOU TRAVELED FROM THE EARTH TO THE SUN AT THAT SAME SPEED, YOU COULD MAKE THE TRIP IN A LITTLE OVER 8 MINUTES. AND IF YOU WERE TO TRAVEL FROM EARTH TO PLUTO AT THE SPEED OF LIGHT, YOU COULD MAKE THE TRIP IN A LITTLE OVER 5 HOURS.

----(STOP) (DIFFERENT ENDING - CAN WE USE VIDEO FROM HUBBLE THAT SIMULATES FLYING THROUGH THE NEBULA?)

**DEAN:** SO WE'RE GOING TO FLY YOU THROUGH THE ORION NEBULA AND TAKE A CLOSER LOOK AT THIS STAR FACTORY.

**JAMES:** THE FORCE OF GRAVITY IS BRINGING CLOUDS OF GASES TOGETHER AND WHEN THEY BEGIN FUSING ELEMENTS, BANG! A STAR IS BORN.

**DEAN:** MODERN TELESCOPES HAVE ALLOWED US TO LOOK DEEP INSIDE THE NEBULA AND SEE NEWBORN STARS AND DISCS OF MATERIAL.

**JAMES:** THESE DISCS COULD BE FORMING PLANETS LIKE THOSE IN OUR SOLAR SYSTEM. IT COULD TAKE THOUSANDS OR EVEN MILLIONS OF YEARS FOR THESE PROTOPLANETARY DISCS TO TURN INTO SOLAR SYSTEMS, BUT WE'LL KEEP WATCHING.

**DEAN:** AND YOU SHOULD TOO! LOOK FOR THE ORION NEBULA THIS WEEK AND PEER DEEP INTO SPACE. IT'S ALL THERE WHEN YOU...

**BOTH:** KEEP LOOKING UP!