ANCIENT ASTRONOMIES OF THE WORLD: ASTR 2000

• COURSE INSTRUCTOR: JOHN STOCKKE, PROF. OF ASTRONOMY

• CLASS MEETINGS: TUESDAY IN BESC 180 (here !) and THURSDAY AT FISKE PLANETARIUM

• COURSE PURPOSES: TO INSPIRE YOU TO KNOW AND LOVE THE SKY AS YOU KNOW AND LOVE THE EARTH.

• TO LEARN WHAT ANCIENT AND INDIGENOUS PEOPLES KNEW ABOUT THE SKY

• and in the process, GET TO KNOW A BIT ABOUT INDIGENOUS CULTURES WORLDWIDE
EARTH AT NIGHT

Earth at Night
More information available at:

NOTICE THAT ALL IN USA EAST OF KANSAS CITY IS “LOST”
Soon silence will have passed into legend. Man has turned his back on silence. Day after day he invents machines and devices that increase noise and distract humanity from the essence of life, contemplation, meditation. Tooting, howling, screeching, booming, crashing, whistling, grinding, and trilling bolster his ego. His anxiety subsides.

Jean Arp, French Sculptor
Soon darkness will have passed into legend. Humans have turned their back on darkness. Night after night they invent machines and devices that increase lighting and distract humanity from the essence of life, contemplation, meditation.

Searchlights, street lights, spotlights, car lights, security lights, electronic billboards and jumbo-trons bolster the human ego and “protect us” from the darkness so our anxiety subsides.

… with thanks & apologies to Jean Arp
“In Florida, artificial lights have had a disastrous impact on sea turtle populations. During the summer and the early fall, hatchlings, which emerge primarily at night from nests on Florida beaches, are often fatally attracted to street lights, house lights and other sources of artificial illumination, dying after being drawn into open areas, where they are easily attacked by predators, or onto roads. The problem is that newborn sea turtles instinctively move toward the brightest part of the horizon... which, for millions of years, would have been not shopping malls and beach houses, but the night sky over the open sea.”

David Owen in the *New Yorker* magazine, Aug 20, 2007
WHAT WILL WE STUDY THIS TERM?

SKY PHENOMENA

HOW THE SKY LOOKS, HOW IT MOVES AND HOW OBJECTS APPEAR, DISAPPEAR AND MOVE
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SKY PHENOMENA

HOW THE SKY LOOKS, HOW IT MOVES AND HOW OBJECTS APPEAR, DISAPPEAR AND MOVE
KNOWING THE SKY ALLOWS US TO KNOW WHAT THEY KNEW and to know them

Pius Mao Piailug of Satawal in Micronesia, THE LAST TRADITIONAL POLYNESIAN NAVIGATOR or “WAYFINDER”….died two years ago, but not before passing on his knowledge

He was flown to Hawaii to use the stars to navigate Hokule'a (cataraman at left above) to Tahiti and back even though he had never been more than 500 miles from his home island…and he did it!
JUST AS DARK SKIES ARE LOST TO THE “WESTERN TECHNOLOGICAL MONOCULTURE”… SO THE DIVERSITY OF CULTURES ALSO ARE BECOMING LOST IN THE PUSH FOR GLOBALIZATION

WHAT IS IT THAT IS LOST?

AT THE VERY LEAST A DIVERSITY OF UNDERSTANDING OF WHAT IT MEANS TO BE HUMAN and

THE INDIGENOUS WORLD-VIEW WHICH INCLUDES A DEEPER CONNECTION TO THE NATURAL WORLD

JOHN AND FORTUNATO FIND VENUS IN THE DAYTIME AT Q'ERO IN THE HIGH ANDES
HOW ANCIENT PEOPLE ALIGNED THEIR STRUCTURES AND TO COME INTO ORIENTATION WITH THE COSMOS

PYRAMIDS AT GIZA ALIGNED TO TRUE NORTH & SO WITH ORION (OSIRIS) CROSSING THE MERIDIAN... but then the religious outlook changed... So that 1000 YEARS LATER, TEMPLES WERE ALIGNED WITH SOLSTICE DAWN
PREDICTING FUTURE EVENTS IN THE SKY
SETTING CALENDARS BY THE SUN
What is the moon phase now?
When you notice the Pleiades rising, start your reaping, and your sowing when they are setting. They are hidden from your view for a period of forty full days, both night and day, but then once again as the year moves around, they reappear at the time for you to be sharpening your sickle.

— Hesiod of Greece, 9th century, BCE

- **Tara Jungo** in Mali
- **Matariki** in Polynesia
- In Japan they are **Subaru**
- To the Lakota Indians: **Winchiala Sakowin**
- To the Inca these stars are called **Colca** and create the calendar
THE ANCIENTS WERE INSPIRED BY AWESOME SKY EVENTS ... TO LEARN MORE ABOUT OUR WORLD
THE ANTIKYTHERA MECHANISM: c. 200 BCE
INTRODUCING YOUR LEARNING TEAM:

BOBBY WALLACE, Teaching Assistant (TA)

KATE VANN, Learning Assistant (LA)

JOHN STOCKKE, Professor

And....YOU!
ARTICLE ON MULTI-TASKING

- WHAT DOES DOPAMINE HAVE TO DO WITH MULTI-TASKING?
ARTICLE ON MULTI-TASKING

- WHAT DOES DOPAMINE HAVE TO DO WITH MULTI-TASKING?

- DOES MULTI-TASKING PROMOTE CREATIVE OR HABITUAL THINKING?
ARTICLE ON MULTI-TASKING

- WHAT DOES DOPAMINE HAVE TO DO WITH MULTI-TASKING?

- DOES MULTI-TASKING PROMOTE CREATIVE OR HABITUAL THINKING?

- DID YOU READ THE ENTIRE ARTICLE OR DID YOU GET DISTRACTED?

- “STICK TO THE GOAT AT HAND!”
What’s needed?

- **SHAMATHA**: FOCUS, SINGLE-POINTED ATTENTION IN AN OTHERWISE CALM MIND. ALSO CALLED “MINDFULNESS”

AND

- **VIPASSANA**: CURIOUS and PENETRATING INVESTIGATION IN AN OTHERWISE CALM AND FOCUSED MIND.

These are the two “pillars” of Buddhist meditative practice but also an essential of modern learning and life.
SYLLABUS & REQUIREMENTS FOR THIS COURSE

• ORGANIZATION AND FOCUS OF COURSE IS ON UNDERSTANDING “NAKED EYE” ASTRONOMY USING EXAMPLES OF KNOWLEDGE AND USE FROM ANCIENT AND INDIGENOUS CULTURES

• LECTURES AND COURSE NOTES: PRIMARY COURSE MATERIAL; MOSTLY ASTRONOMY, PART ANTHROPOLOGY

• COURSE GRADE:

MIDTERM EXAM, FINAL EXAM, RESEARCH PAPER: CHOOSE 2 OF THESE 3 FOR 25% + 25% OF GRADE
WEEKLY HOMEWORK SETS 25%
SELF-PACED OBSERVING PROJECTS 25%
“STUMP THE TA/LA” QUESTIONS: EXTRA CREDIT
MATH REQUIREMENT

• EMPHASIS IS ON LOGICAL PROBLEM SOLVING:

• MATH LEVEL REQUIRED IS HIGH SCHOOL LEVEL ALGEBRA AND GEOMETRY

• HOMEWORK WILL REQUIRE QUANTITATIVE REASONING

• EXAMS WILL ALLOW ONE PAGE OF NOTES AND CALCULATOR

• IF YOU ARE UNCERTAIN IF YOU ARE PREPARED TO TAKE COLLEGE SCIENCE COURSES, TAKE THE MATH SELF-TEST AT:

https://aac.colorado.edu/orientation/mathtest.asp
Astronomy Help Room

When: Tuesday, Wednesday, and Thursday 2-6 PM
Where: Duane D142

Come get free help with your physics, astronomy, and math homework!
LECTURE PROTOCOLS

1. TUESDAYS HERE IN BENSON ARE LESS FORMAL AND GOOD FOR QUESTIONS
2. THURSDAYS AT FISKE ARE MORE FORMAL LECTURES AND MULTI-MEDIA “SHOWS”
3. IMPORTANT TO ARRIVE AT FISKE ON TIME SINCE WE TURN OFF LIGHTS
4. ACADEMIC HONESTY; REVIEW CU HONOR CODE
5. DISABILITIES? PLEASE SEE ME AT YOUR Earliest Convenience
6. NO CELLPHONES, TEXTING, FACEBOOK ETC; PLEASE MINIMIZE DISTRACTIONS TO Yourself & Others
7. LECTURE NOTES COVER THE BASICS
WHAT I DO

• PROFESSOR OF ASTRONOMY AT CU SINCE 1985
  CO-CREATOR OF ASTRONOMY MAJOR AT CU IN 2002

• PRIMARY RESEARCH AREA IS USE OF HUBBLE SPACE TELESCOPE TO STUDY GAS IN SPACE BETWEEN US AND DISTANT QUASARS. I USE ALL TYPES OF SPACE AND GROUND-BASED TELESCOPES (RADIO, OPTICAL, INFRARD, UV AND X-RAY) IN MY RESEARCH.

• SECONDARY RESEARCH AREA IS THE STUDY OF ANCIENT AND INDIGENOUS ASTRONOMIES AROUND THE WORLD; FIRST-HAND EXPERIENCE WITH: NAVAJOS, LAKOTA, AUSTRALIAN ABORIGINALS, ABORIGINAL INCA, AND TRADITIONAL POLYNESIAN NAVIGATION
Hubble was built to be serviced, repaired, and upgraded

Hubble Servicing Mission #4: Install the CU instrument
May 2009

Cosmic Origins Spectrograph
JOHN, LENNIE, PAUL AND BILL HARNEY AT GONDAWAK, THE MOONDREAMING SITE
QUESTION

HOW DO THE STARS APPEAR TO MOVE ACROSS THE SKY EACH NIGHT?

1. EAST TO WEST JUST LIKE THE SUN OR MOON

2. ALL MOVE DIFFERENT DIRECTIONS DEPENDING ON THEIR LOCATION IN THE SKY

3. ALL MOVE DIFFERENT SPEEDS DEPENDING ON THEIR DISTANCE FROM US

4. THE STARS STAY AT FIXED LOCATIONS ALL NIGHT LONG
ANSWER TO THIS QUESTION ON THURSDAY AT FISKE PLANETARIUM

NEXT CLASS THURSDAY: AT FISKE !!

PEOPLE ON WAIT LIST COME SEE ME NOW ...