

# Conference on Archaeoastronomy of the American Southwest III

## Outline of Pre-Conference Workshop

### 1. Introduction

- 1.1. How did this event come together?
- 1.2. Who is involved?
- 1.3. We think it is important to have a formalized methodology of archaeoastronomic documentation?
- 1.4. What do we hope to accomplish in this workshop?

### 2. Brief overview of the disciplines of Astronomy

- 2.1. Cultural Astronomy compared to modern Astrophysics
- 2.2. Sub Disciplines of Cultural Astronomy
  - 2.2.1. Ethno astronomy
  - 2.2.2. History of Astronomy
  - 2.2.3. Archaeoastronomy
    - 2.2.3.1. Refined Definition

*“The Archaeoastronomer seeks to identify and describe evidence of astronomical knowledge embedded in the material culture of prehistoric peoples”.*

2.2.4. A fundamental knowledge of celestial mechanics (astrometry) is particularly helpful in all research involving Cultural Astronomy.

### 3. Manifestations of Astronomic knowledge in Prehistoric Culture Classified... An Introduction

- 3.1. Direct Sight Observation
- 3.2. Sun Shadow Projected Events
- 3.3. Representational Depictions
- 3.4. Building and town plan orientations: Imbedded use of Cardinal directions
- 3.5. Counting Systems - Inferring accumulated astronomic knowledge over long-term observations.

### 4. Celestial mechanics – coordinate systems

- 4.1. Alt. Azm Horizontal
- 4.2. Spherical Geometry
  - 4.2.1. Lat. Lon. On earth
  - 4.2.2. RA/ Dec. Celestial
  - 4.2.3. Ecliptic coordinates
- 4.3. Orbital elements
- 4.4. Precession of Nodes
- 4.5. Relationships/ usage/ formulas
  - 4.5.1. The analemma
  - 4.5.2. Retrograde motion of Planets
  - 4.5.3. Eccentricity
  - 4.5.4. Nutation

### 5. Line of sight systems

- 5.1. Horizons events
  - 5.1.1. Sun rise/set
    - 5.1.1.1. Formula for Latitude Solstice bearing relationships
    - 5.1.1.2. Stand stills
    - 5.1.1.3. True Astronomical horizon vs. observed horizon
    - 5.1.1.4. The issue of equinox
      - 5.1.1.4.1. Uneven day count from solstice to cardinal east
      - 5.1.1.4.2. Large daily movement at equinox
    - 5.1.1.5. Cross Quarters by Day Count by a Division of Degrees
  - 5.1.2. Moon rise set
    - 5.1.2.1. Maxima Minima

# Conference on Archaeoastronomy of the American Southwest III

## Outline of Pre-Conference Workshop

- 5.1.3.Stars at horizon
  - 5.1.3.1. Heliacal Rise
  - 5.1.3.2. A discussion about precession (this is where it counts)
- 5.1.4.Planets as direct site events.
  - 5.1.4.1. Characteristics of planetary motion
- 5.2. Other Line of Sight
  - 5.2.1.Window/portal
    - 5.2.1.1. EX. Egyptian ... Thuban
    - 5.2.1.2. EX. Hogan ... Ceiling window sight
- 6. Sun Shadow Systems
  - 6.1. Panel systems
    - 6.1.1.EX. Fajada Butte
      - 6.1.1.1. Moon Shadow
    - 6.1.2.EX. V Bar V site
  - 6.2. Gnomon systems
  - 6.3. View port 'oculus' systems.
    - 6.3.1.Casa Rinconda
    - 6.3.2.Aztec
- 7. Representational cosmology
  - 7.1.1.Rock art
    - 7.1.1.1. EX. Chaco Super Nova
  - 7.1.2.Ceiling pictograph
    - 7.1.2.1. EX. Navajo cave ceiling
  - 7.1.3.Oral Tradition
    - 7.1.3.1. Relationship to Ethno Astronomy
- 8. Building or Town Layout Orientation Knowledge and Establishment of Cardinal Directions
  - 8.1. Four ways to determine cardinal points.
    - 8.1.1.Northern Sky (in the Northern Hemisphere)
    - 8.1.2.Southern transit gnomon events
    - 8.1.3.Equinocal calculated east west events
    - 8.1.4.Direct sight east west
  - 8.2. EX. Pyramids at Giza
  - 8.3. EX. Teotihuacán
  - 8.4. EX. Chacoan Site Relationships
- 9. Counting Systems and Knowledge of Long Term Cycles
  - 9.1. Calculation of long cycle events
    - 9.1.1.Lunar Maxima
    - 9.1.2.Eclipse cycles
  - 9.2. Maya Calendar
    - 9.2.1.Venus' wild ride
    - 9.2.2.A discussion about cycles longer than lifespan.
- 10. COMPUTER LAB Planetarium Software Review
- 11. Methodology and Documentation
  - 11.1.1. Some examples
    - 11.1.1.1. Discussion
  - 11.1.2. Introducing ... A check sheet
- 12. Our place in the Universe....Human perception of space and time then and now.