

Lockhart Planetarium Session No. 1

INTRODUCTION TO THE NORTH CIRCUMPOLAR SKY

(Duration: 1.5 - 2 hrs)

Summary of Presentation

INTRODUCTION TO THE LAB: ADMIN

Attendance & Group Assignments

Review of Handouts

- Syllabus
- Fall Schedule
- Planetarium/Lab/Observing OverView
- Lab Exercises
 - Diffraction Grating Spectroscope Construction
 - Rotation & Revolution of the Earth Observing Project
- Observing
 - General Information for Field Trip
 - Notes on Observing
 - Star Charts
 - Observing Exercises

INTRODUCTION TO THE NORTH CIRCUMPOLAR SKY

Orientation to the Night Sky

Exercise for the Students

Students describe their observation of the daily motion of the sun across the sky as an arc. They make explicit the technical language that they use and provide definitions for:

- horizon & zenith
- rising & setting
- celestial meridian
- cardinal points - also compass directions between

Informal introduction to a spherical coordinate system

- fundamental reference circle: horizon
- coordinates: azimuth & altitude
- Use of alt-azimuth spherical coordinate system for finding objects in the sky
 - very natural coordinate system to use
 - measuring angles on the sky using outstretched arm (*Notes on Observing*)
 - measuring altitude in the planetarium

Introduction to the Constellations of the North Circumpolar Sky

- Observing with star charts
 - dark adaptation & the use of red shielded flashlights
- Distinction between asterism, constellation figure & constellation.
 - kudurru - boundary stone depicting serpent, lion & scorpion
 - Latin used for naming constellations
- The naming convention for stars in a constellation
 - The Greek alphabet (*Notes on Observing*)
 - exceptions - Big Dipper stars are named in order of appearance
- Proper names for the brightest stars (Arabic)

CONSTELLATIONS

- *Ursa Major*
 - Pointer star names of Big Dipper
- *Ursa Minor*
 - finding Polaris - 5 separations of pointer stars
 - North Celestial Pole & star trails
- *Cassiopeia*
 - outline figure - back of throne, knee & foot
 - useful combinations of stars to locate other constellations
- *Perseus*
 - using Cass stars in combination find curly J or y
 - Algol - eclipsing binary star system => masses, sizes
- *Cepheus*
 - using Cass stars in combination find δ Cephei
 - cepheid variable prototype => standard candle
- *Draco*
 - between the dippers catch the tail & curl around the Little Dipper
 - precessional circle of North Stars over 26,000 year cycle ($23\frac{1}{2}^\circ$ radius)
 - North Ecliptic Pole in dragon's coils

REFERENCE HANDOUTS

- Notes on Observing
- General Information on Observing
- StarCharts
- Observing Exercises