

## **STELLARIUM TUTORIAL**

*Apparent Motion of the Stars*

**FOCUS QUESTION:** Our nearest star, the sun, follows both a daily and an annual cyclical pattern. What cyclical pattern(s) do other stars follow?

1. Set time to the present, location to Horizons Observatory, and direction as due south. Turn off the atmosphere (a). Show constellation lines (c) and labels (v).

Increase Time Speed (lower right menu, three clicks) for twenty-four hours. As the time runs observe the movement of stars and constellations. Run slow enough observe the stars' motion. Repeat this for one full day (24 hours) each season (a total of four). **DESCRIBE THE OBSERVED MOTION AND MAKE A CONJECTURE AS TO THE CAUSE OF THIS NIGHTLY MOVEMENT PATTERN.**

2. Change the direction to due north and center Polaris. Keep the other settings the same as #1. Follow the same procedure for observing the stars. **DESCRIBE AND EXPLAIN THIS NIGHTLY MOVEMENT PATTERN. IN YOUR DESCRIPTION, CONTRAST THE NORTHERN AND SOUTHERN PATTERNS AND MAKE A CONJECTURE AS TO THE CAUSE OF THE DIFFERENCE.**

3. Reset to the present and direction due south. Keep both constellation lines and labels. However, now use the Date/Time icon and highlight months. Observe the motion of stars over the course of a full year, one month at a time. **DESCRIBE THIS MOTION AND MAKE A CONJECTURE AS TO ITS CAUSE. AS WELL, COMPARE THE STELLAR MOTION OVER THE COURSE OF A YEAR TO STELLAR MOTION OVER THE COURSE OF A DAY.**

4. **PREDICT THE MOVEMENT PATTERN OVER THE COURSE OF A YEAR WHEN CENTERED ON POLARIS (DUE NORTH), THEN CHECK YOUR PREDICTION ON STELLARIUM. BRIEFLY DESCRIBE AND EXPLAIN THE PATTERN OBSERVED.**

5. Reset configuration to #3, but highlight year. **PREDICT THE MOTION OF THE STARS OVER THE YEARS (WHERE MONTH/DAY/TIME REMAIN THE SAME).** Observe the motion of stars over the course of one hundred years into the future and, then, into the past. **DESCRIBE THIS MOTION AND MAKE A CONJECTURE AS TO ITS CAUSE. COMPARE THE STELLAR MOTION OVER THE COURSE OF A CENTURY TO STELLAR MOTION OVER THE COURSE OF A DAY AND THROUGHOUT FOUR SEASONS. DO YOU THINK THIS PATTERN WILL CHANGE IF VIEWING TO THE NORTH? CHECK YOUR PREDICTION.**