

## **Brief Descriptions of Hands On Solar System Activities** (from Teacher Guide, pp.6-7)

### ***Introduction: What's Out There*** (CLASSROOM — 10 min)

Students brainstorm a list in answer to the question, “What types of things do we find in the night sky?”

### ***Part I. The Moon—Our Closest Neighbor***

#### **A. The Image Processor** (LAB — 35 min)

Students learn how to use the HOU Image Processing software while exploring characteristics of craters on the Moon. Image Processor concepts: Zoom, Pixels, Coordinates, Brightness.

#### **B. Crater Game** (LAB — 20-30 min)

In this game, students get practice using their Image Processing software to determine diameters of craters.

#### **C. Moon Measure** (LAB — 20-30 min)

Students investigate images of Moon craters, valleys and mountains and walls. They measure the diameter of a crater and its circumference using Image Processing tools.

#### **D. Model Craters** (CLASSROOM — 20-30 min)

Students make model Moon craters and see how the pattern of shadows associated with craters is affected by the angle of sunlight shining on them. Optional: they toss meteoroids (pebbles) into basins of flour to simulate crater formation.

#### **E. Moon Phases** (CLASSROOM — 15 min)

With the Moon being a white polystyrene ball and the Sun being a bright light at the center of the room. Each student's head represents the Earth. Students can also observe and record the real phases of the Moon over a period of a couple of weeks (can be homework).

### ***Part II. Comets***

#### **A. False Color Comet** (LAB — 30 min)

Students learn the IP software functions: Min-max, color palette

#### **B. Comet set — Earth's rotation** (CLASSROOM — 10 min)

It looks like objects change position because Earth is spinning.

#### **C. Comet motion** (CLASSROOM — 10-20 min)

Students learn how, since a comet is in orbit around the Sun, it appears to move with respect to background stars.

#### **D. Comet Orbits** (CLASSROOM — 30 min)

Students draw ellipses to compare the shapes of orbits.

### ***Part III. Asteroids*** (LAB — 30 min)

Students learn how asteroids can be discovered by comparing two images of the same place in the sky. They also learn the difference between an asteroid and a comet.

### ***Part IV. Planets***

#### **A. Jupiter and Its Moons** (LAB — 20-30 min)

Students measure the orbit radii of some of Jupiter's moons.

#### **B. Jupiter Rotation** (LAB — 15-20 min)

Students deduce Jupiter's rotation observing the Red Spot.

#### **C. Planet Survey** (COMPUTER LAB — 20-30 min)

Students review (or learn) all the types of bodies in the solar system. They find planet sizes with IP software.

#### **D. Outer Planets** (COMPUTER LAB — 20-30 min)

Students use proportion and/or algebra to calculate the orbit radius of a moon.