

## **VIII. Meteorites & Asteroids**

### **B. Asteroids - a type of “minor planet”**

#### **1. Basics**

- a. Non-spheroidal, rocky or metallic objects >1 meter in size (may have ice)**
- b. Most: between Mars & Jupiter**
- c. Abundance**
  
- d. Probably would have accreted into a planet, if not for Jupiter’s gravitational influence**
- e. Total mass of all asteroids**

#### **2. Asteroid Belt (Main Belt)**

- a. Inner Asteroid Belt**
  
- b. Outer Asteroid Belt**

#### **3. Near-Earth Asteroids (NEAs)**

#### **4. Hilda Asteroids**

#### **5. Trojan Asteroids**

#### **6. Compositions**

- a. Some are metal & some are rocky**
- b. Spectroscopic classification (many difference schemes)**

**i. C-type asteroids**

**ii. E-type asteroids**

**iii. M-type asteroids**

**iv. S-type asteroids**

**v. V-type asteroids**

**7. Physical characteristics**

**a. Irregularly-shaped**

**b. Many are heavily cratered, but no ejecta deposits**

**c. Covered in dusty regolith**

**8. Visited asteroids**

**a. Gaspia**

**b. Eros**

**c. Ida**

**d. Mathilde**

**e. Lutetia**

**f. Itokawa**

**g. Ryugu**

**h. Bennu**

**C. Vesta**

**1. Visited by *Dawn* in 2011-2012**

**2. 2<sup>nd</sup>-largest body in the Asteroid Belt & largest asteroid**

**3. Location**

**4. Size - 572 x 557 x 446 kilometers**

**5. One Vesta year =**

**One Vesta day =**

**6. Variable albedo (has light areas & dark areas)**

**7. Density**

**8. Vesta is a disrupted, differentiated protoplanet**

**9. No atmosphere (no air)**

**10. Rheasilvia**

**11. Equatorial troughs**

**12. Probable source of HED meteorites**

**13. Heavily cratered**

**D. Ceres**

**1. Visited by *Dawn* in 2015-2018**

**2. Largest body in Asteroid Belt, but not an asteroid - dwarf planet**

**3. Location**

**4. Size**

**5. One Ceres year =**

**One Ceres day =**

**6. Low albedo**

**7. C-type object**

**8. Density**

**9. Internal structure**

**10. Almost no atmosphere**

**11. Bright spots (especially common in Occator Crater)**

## **12. Impact craters**

**13. Cryovolcanism - lavas are brines or other liquids that cool to  
ices**