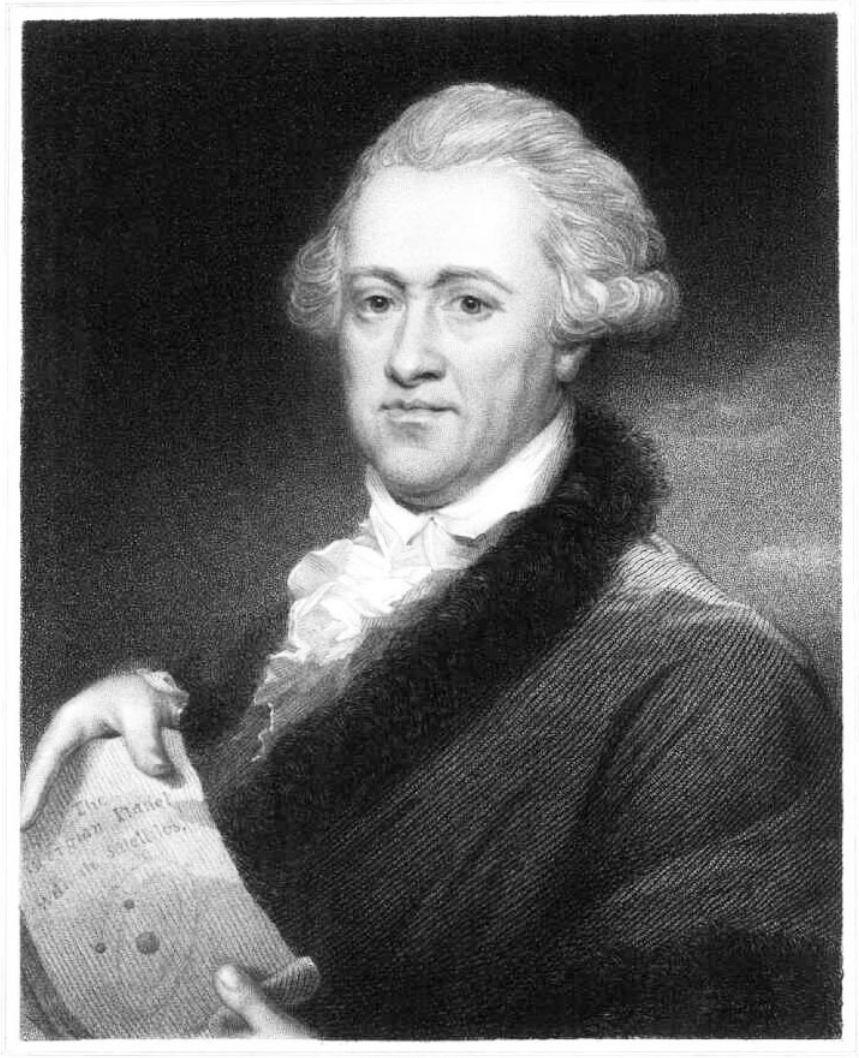
4.6: Moving Objects, Spectra, and the Doppler Effect

The **Doppler Effect** is a change in an object's spectrum because the object is moving closer or away from the observer. In **sound** we experience this change in a siren's pitch. When it approaches us, the waves are being compressed, then becoming longer as it moves away. This increase in pitch can be heard as a police car approaches and then decreases as it moves farther away. **What are the Implications of Doppler Shift?**

1. **What are The Astronomical Implications and Importance of Spectra?**
    1. How do we know what a star is made up of?
        - *From the star's spectra*
    2. How do we know if an object, star, galaxy, etc., is moving towards or away from us?
        - *Look for a red or blue shift in the object's spectra*
    3. Can we tell how fast an object is moving towards or away from us?
        - *Yes, by the extent of red or blue shift*

Consider this…



Astronomer Frederick William *Herschel*Public Domain

For most of history, visible light was the single most recognized portion of the electromagnetic spectrum, EMS. The ancient Greeks noted that light traveled in straight lines and studied its properties. Over the years the study of light continued. During the 16th and 17th centuries there were conflicting theories which regarded light as either a wave or a particle. In 1800, astronomer Frederick William Herschel discovered infrared radiation while using a thermometer to measure temperatures of visible light frequencies. A year later Johann Ritter discovered ultraviolet radiation.