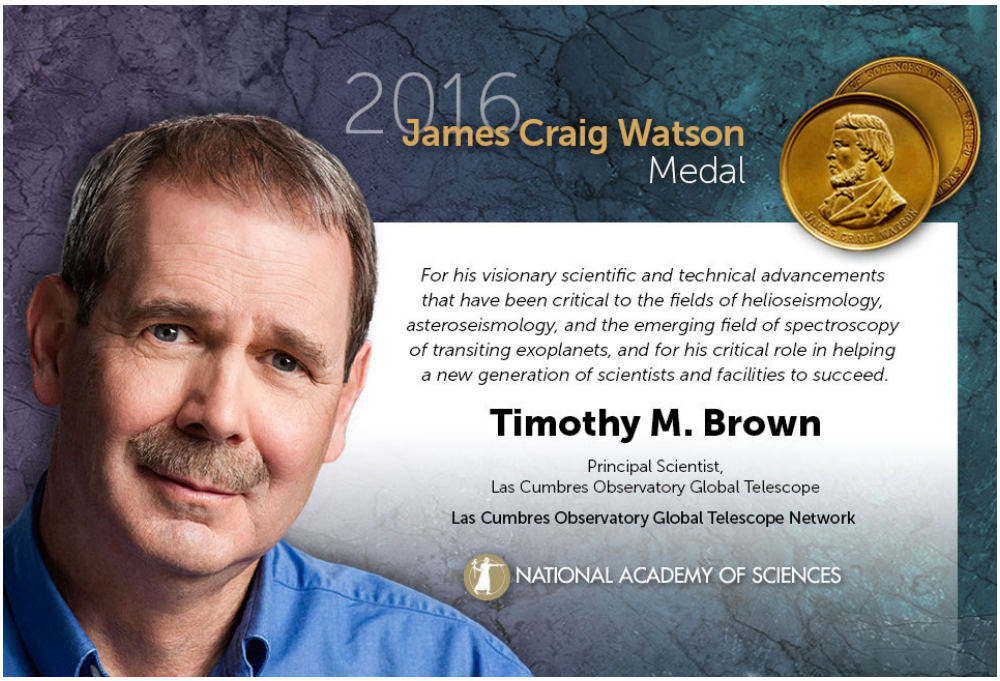

Brown has made many fundamental contributions to astronomy and astrophysics through instrument development, theory and interpretation, and observations. In the field of helioseismology—the study of the sun's interior through the detection of subtle movements on the solar surface—he formulated a method to make extremely sensitive, linear Doppler-velocity images of the sun, called the "Fourier Tachometer." The devices based on this method became key to the field of helioseismology and are used in both ground-based networks and spacecraft that now observe and study the sun. Asteroseismology applies the lessons of helioseismology to detect similar oscillations on other stars, which is challenging since the surfaces of these stars cannot be detected. Here, Brown's pioneering instrument developments and observations led to major advancements in the field and to asteroseismology being included as a science goal of NASA's *Kepler* star-observing mission.

The one area where Brown has made the greatest contribution to modern astrophysics is in enabling the study of atmospheres of exoplanets—planets orbiting stars other than our own sun. Brown and David Charbonneau measured the first transits of an exoplanet, HD209458b, in front of its star, which allowed them to estimate the planet's radius and density and infer its composition. Brown then went on to develop a method to study exoplanet atmospheres through analysis of the light of the planet's parent star, which is altered when it travels through a planet's atmosphere. Brown and colleagues employed this method to make the first detection of an exoplanet atmosphere using data gathered from the Hubble Space Telescope. This technique is now used by teams around the globe and has been applied to dozens of faraway worlds.