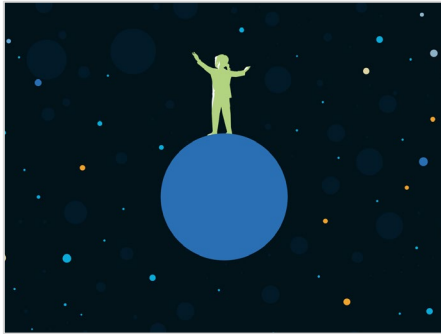


Student Worksheet – Physics Prize 2019

New perspectives on our place in the universe



How did the universe – with all its stars and planets – evolve? What does it consist of? Are there solar systems that resemble our own?

James Peebles, Michel Mayor and Didier Queloz have helped find answers to some of these big questions.

James Peebles developed theories about the evolution of the universe.

Among other things, he predicted "cosmic background radiation", which should have arisen when the universe was formed by the Big Bang. His theory turned out to be correct. Later measurements of background radiation have provided even more knowledge about the universe. There must be more matter and energy in the universe than we have been able to see, so far. Peebles advanced a theory about "dark matter" that explains some of the missing matter. There is probably also "dark energy", which we don't yet know anything about.

Michel Mayor and Didier Queloz searched for "exoplanets" – planets located elsewhere in the universe. For a long time, scientists suspected that stars other than our sun might also have planets, but it has not been possible to observe them until fairly recently. In 1995, Mayor and Queloz announced that they had discovered a planet orbiting a star that resembles our own sun. This planet, known as 51 Pegasi b, is very hot: around 1000 degrees Celsius. There is surely no life on that planet, but perhaps on other planets far away in the universe.

Vocabulary list

COSMIC BACKGROUND RADIATION Weak radiation that is a relic of the Big Bang, when the universe was formed. This radiation exists everywhere in space and consists of microwaves, a kind of light with lower energy than visible light.

DARK MATTER A kind of invisible matter that doesn't affect us with any force other than gravity.

EXOPLANET A planet that orbits a star other than our own sun.

What do you think?

What is the most interesting thing about the Laureates' work?

Alfred Nobel wanted the work of the Nobel Laureates to "have conferred the greatest benefit to humankind". What will be the greatest benefit of the 2019 Laureates' achievements?
