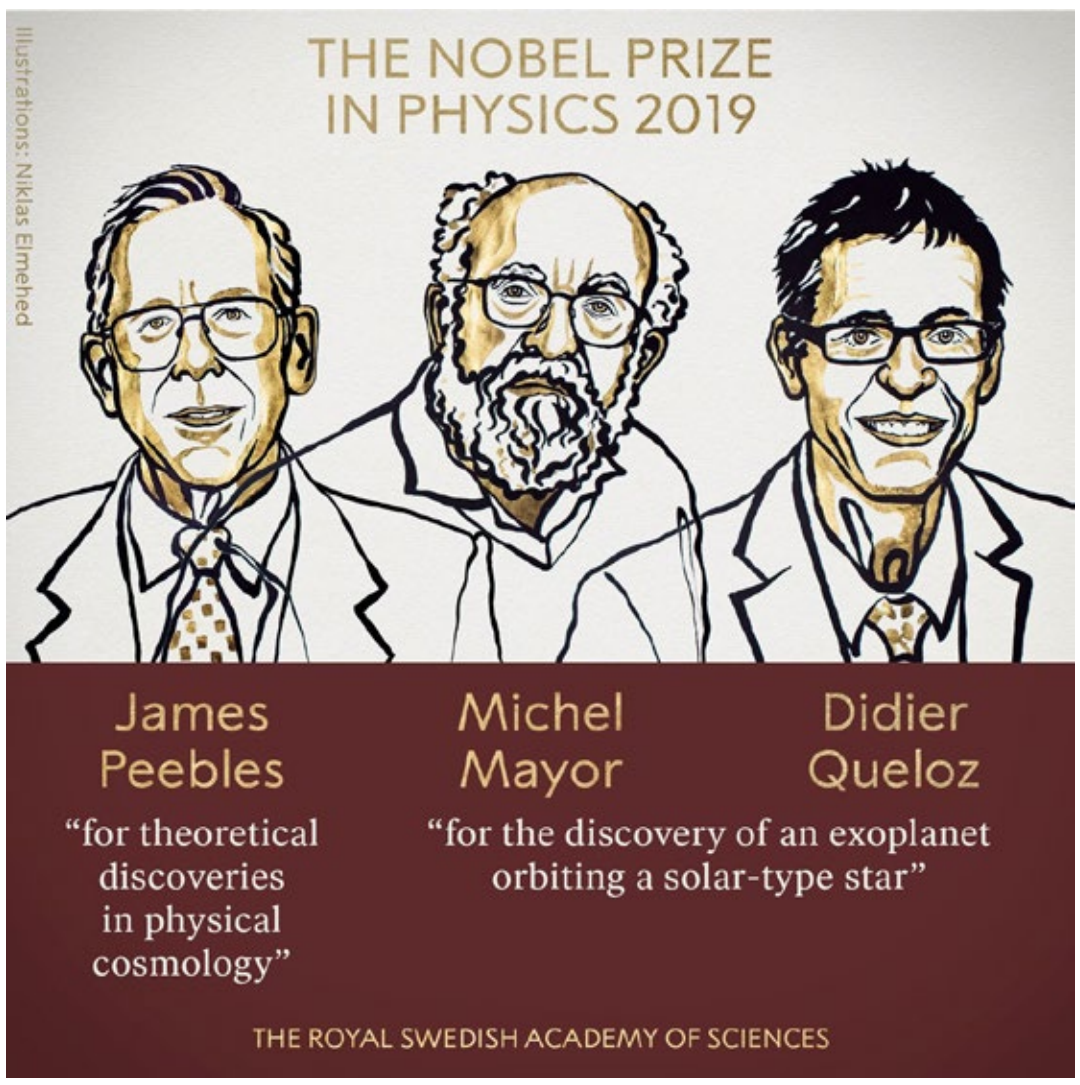
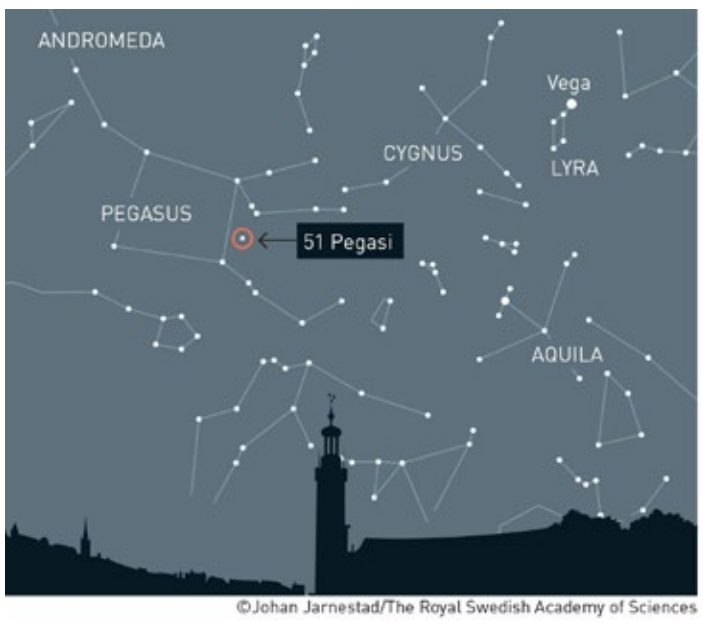
Nobel Physics honours dark matter, exoplanets





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This year's Physics Laureates Michel Mayor and Didier Queloz have explored our home galaxy, the Milky Way, looking for unknown worlds. In 1995, they made the first discovery of a planet outside our solar system, an exoplanet, orbiting a solar-type star, 51 Pegasi.

Goran K Hansson (c), Secretary General of the Royal Swedish Academy of Sciences, and academy members Mats Larrson (L) and Ulf Danielsson, announce winners of the 2019 Nobel Prize in Physics during a news conference at the Royal Swedish Academy of Sciences in Stockholm, Sweden

YOU KNOW WHAT

The discovery by 2019 #NobelPrize laureates Michel Mayor and Didier Queloz started a revolution in astronomy and over 4,000 exoplanets have since been found in the Milky Way. Strange new worlds are still being discovered, with an incredible wealth of sizes, forms and orbits.

- The 2019 #NobelPrize in Physics has been awarded with one half to James Peebles "for theoretical discoveries in physical cosmology"
- The other half jointly to Michel Mayor and Didier Queloz "for the discovery of an exoplanet orbiting a solar-type star"

AFP | Stockholm

Canadian-American cosmologist James Peebles and Swiss astronomers Michel Mayor and Didier Queloz yesterday won the Nobel Physics Prize for research that increases the understanding of our place in the universe.

Peebles won one-half of the prize "for theoretical discoveries that have contributed to our understanding of how the universe evolved after the Big Bang," professor Goran Hansson, secretary general of the Royal Swedish Academy of Sciences, told a press conference.

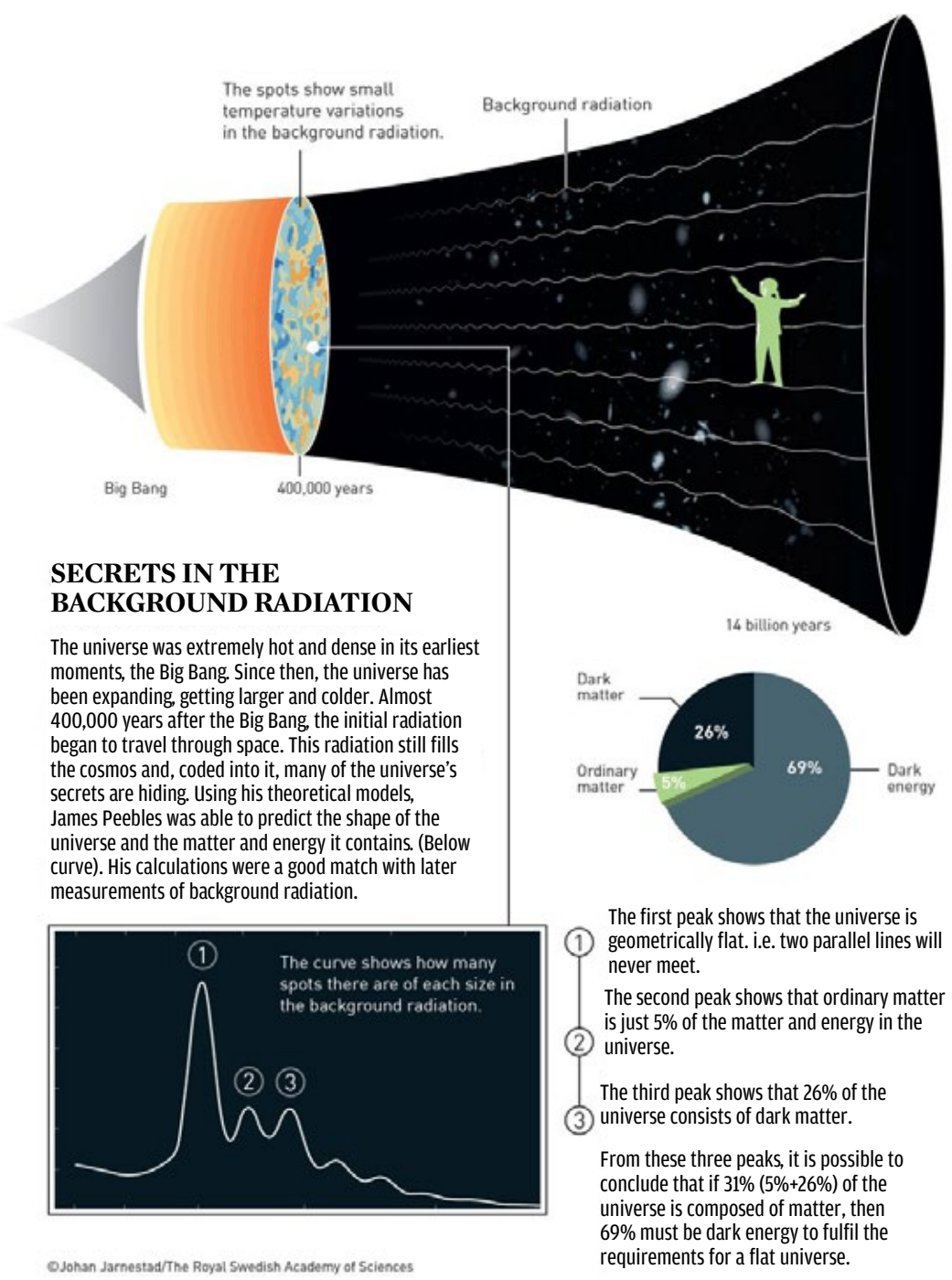
Mayor and Queloz shared the other half for the first discovery, in October 1995, of a planet outside our solar system -- an exoplanet -- orbiting a solar-type star in the Milky Way.

"Their discoveries have forever changed our conceptions of the world," the jury said.

Developed over two decades since the mid-1960s, Peebles' theoretical framework is "the basis of our contemporary ideas about the Universe."

Peebles built upon Albert Einstein's work on the origins of the Universe by looking back to the millenia immediately after the Big Bang, when light rays started to shoot outwards into space.

Using theoretical tools and calculations, he drew a link between the temperature of the radiation emitted after the Big Bang and the amount of matter it created.



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James Peebles took on the cosmos, with its billions of galaxies and galaxy clusters. His theoretical framework, developed over two decades, is the foundation of our modern understanding of the universe's history, from the Big Bang to the present day.

'Revolution in astronomy'

His work showed that the matter known to us -- such as stars, planets, and ourselves -- only make up five percent, while the other 95 are made up of "unknown dark matter and dark energy."

"This is a mystery and a challenge to modern physics," the academy said.

Peebles is Albert Einstein Professor of Science at Princeton University in the United States, while Mayor and Queloz are both professors at the University of Geneva. Queloz also works at the University of Cambridge in Britain.

Using custom-made instruments at their observatory in southern France in October 1995, Mayor and Queloz were able to detect a gaseous ball similar in size to Jupiter, orbiting a star around 50 light years from our own Sun.

Harnessing a phenomenon known as the Doppler effect, which changes the colour of light depending on whether an object is approaching or retreating from Earth, the pair proved the planet, known as 51 Pegasus b, was orbiting its star.

The Nobel jury noted that the discovery "started a revolution in astronomy" and since then over 4,000 exoplanets have been found in our home galaxy.

'Simply extraordinary'

"Strange new worlds are still being discovered," challenging our preconceived ideas about planetary systems and "forcing scientists to revise their theories of the physical processes behind the origins of planets."

In a statement, the two astronomers hailed their win as "simply extraordinary", saying the discovery was "the most exciting of our careers".

The prize consists of a gold medal, a diploma and the sum of nine million Swedish kronor (about $914,000 or 833,000 euros).

The trio will receive the prize from King Carl XVI Gustaf at a formal ceremony in Stockholm on December 10, the anniversary of the 1896 death of scientist Alfred Nobel who created the prizes in his last will and testament.

In 2018, the honour went to Arthur Ashkin of the US, Gerard Mourou of France and Donna Strickland of the US for laser inventions used for advanced precision instruments in corrective eye surgery and in industry.

This year's Nobel prize season kicked off on Monday with the Medicine Prize awarded to Americans William Kaelin and Gregg Semenza, and Britain's Peter Ratcliffe.

They were honoured for research into how human cells sense and adapt to changing oxygen levels, which opens up new strategies to fight such diseases as cancer and anaemia.

The winners of this year's Chemistry Prize will be announced on Wednesday.

The Literature Prize will follow on Thursday, with two laureates to be crowned after a sexual harassment scandal forced the Swedish Academy to postpone the 2018 award, for the first time in 70 years.

On Friday the action moves to Norway where the Peace Prize is awarded, with bookies predicting a win for Swedish teen climate activist Greta Thunberg on betting sites such as Ladbrokes.

The Economics Prize will wrap up the Nobel prize season on Monday, October 14.