

POLISH SUCCESSORS OF COPERNICUS:

IN 1992 ALEKSANDER WOLSZCZAN ANNOUNCES DISCOVERY OF THE FIRST EXTRASOLAR PLANETARY SYSTEM

The discovery was commented on as the greatest accomplishment of a Polish astronomer since the times of Copernicus. Nearly 450 years after the death of his greatest predecessor, Aleksander Wolszczan discovered that an untypical star, pulsar PSR 1257+12 in the Constellation of Virgo, is orbited by three Earth-mass planets.

At that time, Wolszczan was already a renowned world-class specialist in scientific research of pulsars – neutron stars emitting huge electromagnetic impulses with great regularity. During his astronomical observations conducted at the world's biggest radio telescope in Arecibo (Puerto Rico) he noticed minimal changes in the impulse frequency generated by one of the observed pulsars. After almost two years of conducting measurements and calculations he was able to prove that these changes are caused by exoplanets (planets from the outside of the Solar System) that orbit the star.

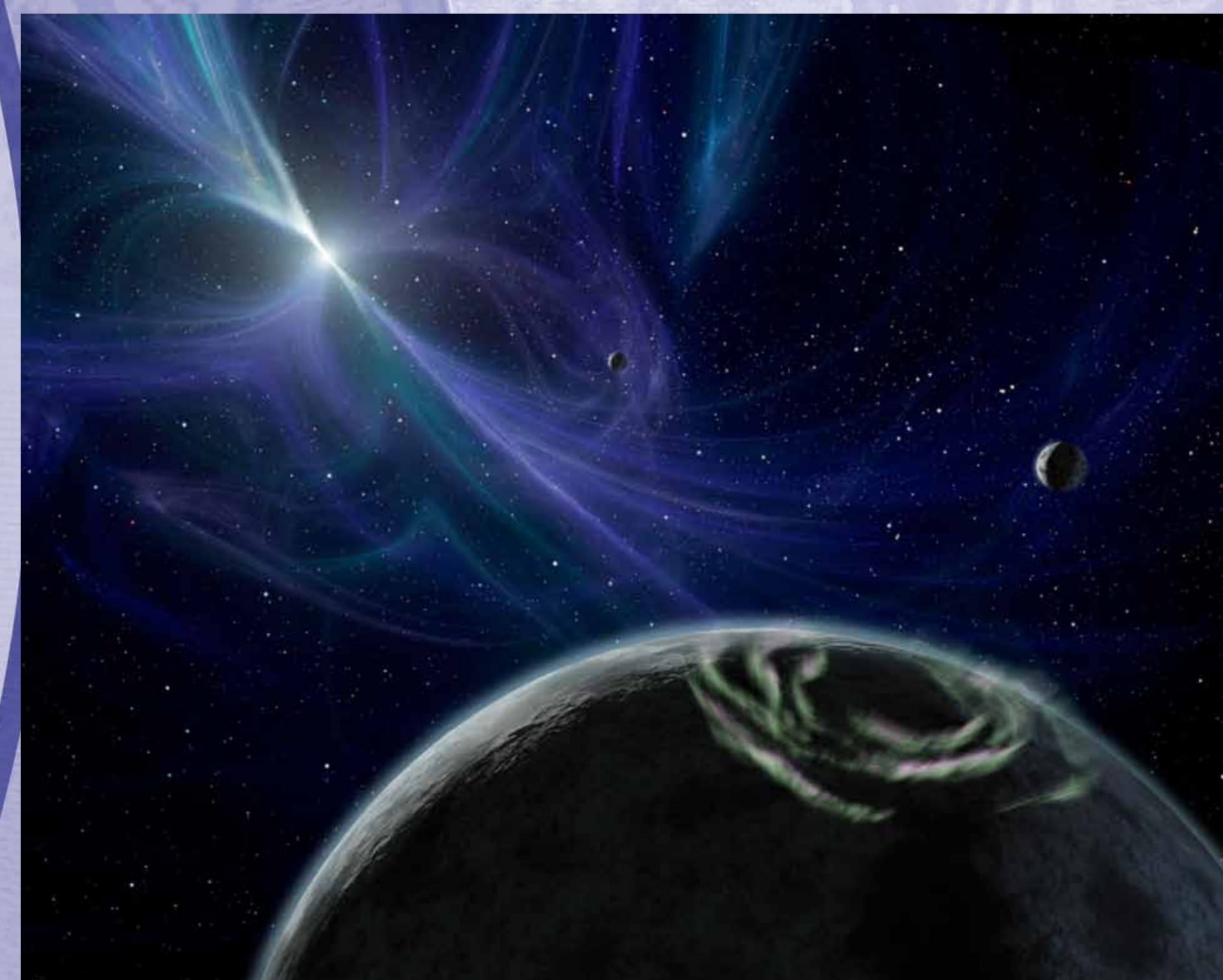
Aleksander Wolszczan, Polish astronomer and astrophysicist, was born in 1946 in Szczecinek (40 thousand inhabitants, located in Zachodniopomorskie Voivodeship). He graduated from the Nicolaus Copernicus University in Toruń and received a PhD in physics at the same university; his thesis concerned pulsars. He left Poland in 1982 and cooperated for many years with a number of US universities. At present he works at the Pennsylvania State University where he lectures astronomy and astrophysics, and still cooperates with his alma mater in Toruń.

In 1999, on the 100th anniversary of the American Physical Society, Nature (the most cited scientific magazine in the world) published 15 texts on physics (including astrophysics) that had been selected from all articles ever published since its first issue in 1869. Among articles by Einstein, Roentgen and other famous scientists, Nature included Wolszczan's information on the discovery of the first exoplanets.

A few years after Wolszczan's discovery, more exoplanets were identified, mostly using different methods, and some Polish astronomers were involved in these discoveries. Today (May 2013) we know of the confirmed existence of 693 planetary systems and 885 exoplanets in these systems. Currently Wolszczan is still involved in the search for planets that orbit stars in more advanced evolutionary stages (his team has discovered over a dozen such stars) and studies radio emissions of these planets and their stars.



Profesor Aleksander Wolszczan, 2008



Artist's impression of extrasolar planets orbiting the pulsar, PSR B1257+12. Pulsars are neutron stars of minimal sizes – in the cosmic scale – that remain after supernovas. Their diameters are not more than 20 km, but they maintain a significant part of the primary star's mass. A one-centimetre cube of pulsar matter could weigh even 100 million tonnes on the Earth, their magnetic fields can be millions of times stronger than the strongest ones generated in our laboratories, they spin several hundred times a second and emit regular beams of radiation with more precision than the best earthly atomic clocks



Pulsar with the surrounding Crab Nebula in Taurus Constellation – remains of a supernova whose explosion was recorded by Chinese astronomers in 1054



Radio telescope in Arecibo (Puerto Rico) with the largest single dish in the world (305 m diameter). The construction is immobile, but as a result of the Earth's rotation, the telescope points to various parts of the sky. With the use of this instrument, Aleksander Wolszczan discovered the first extrasolar planetary system