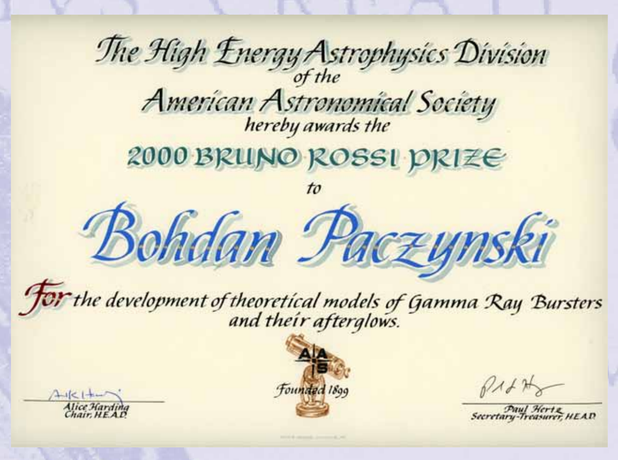
POLISH SUCCESSORS OF COPERNICUS:

OGLE PROGRAMME BY BOHDAN PACZYŃSKI AND ANDRZEJ UDALSKI

Bohdan Paczyński (second from the left) among members of the International Astronomical Union, 1988

Bohdan Paczyński, 1999

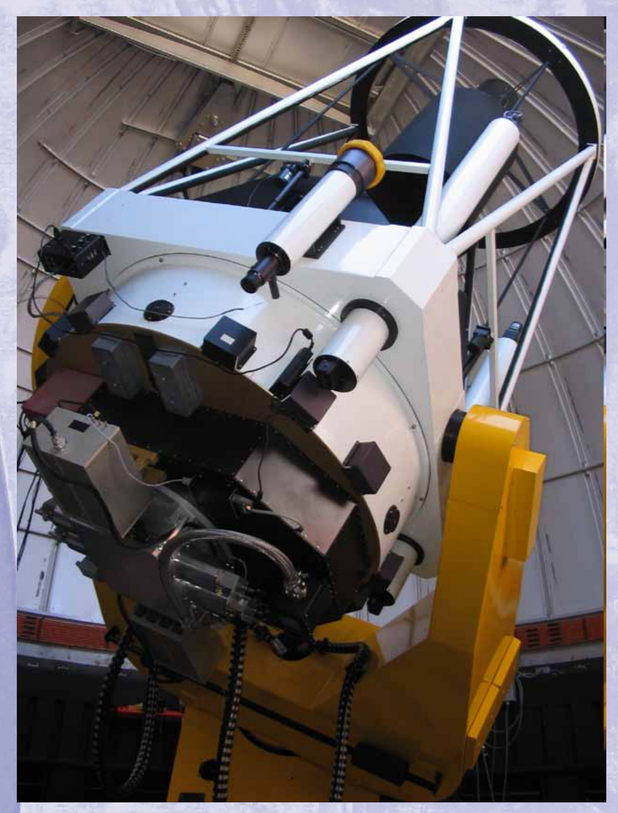


Bruno Rossi Prize awarded to Bohdan Paczyński by the High Energy Astrophysics Division of the American Astronomical Society, 2000

Professor Bohdan Paczyński (born in Vilnus in 1940, died in 2007) was well-known among international astronomers and physicists mainly due to his achievements in 20 years of work in Poland and after 1982 in the US. His greatest discovery is a breakthrough efficient method of multiple monitoring millions of stars to register changes in their brightness. Paczyński, together with his small team composed of scientists from Warsaw University Observatory and Princeton University in the USA, used a phenomenon described by Einstein – gravity bending of light when passing by a large-mass object (the same process occurs with a regular lens). A momentary increase in the brightness of a far-away star may prove that an object – such as a planet – crosses the line between the observer and the star.

In 1992, Paczyński's discovery became the basis of an international Optical Gravitational Lensing Experiment (OGLE) project. Today the project is led by Paczyński's assistant, professor Andrzej Udalski, director of the Warsaw University Observatory. Born in 1957 in Łódź, Udalski is a world-class astronomer and astrophysicist, as well as a talented inventor of many technical solutions without which, according to Paczyński, OGLE project would never be as successful as it is. Already in 2001 the Polish telescope in Chile, combined with a very special camera, could precisely detect the light of 5 million stars in 12 minutes, and repeat the procedure many times every night. Complicated devices enable the identification of the so-called transits, i.e. moments when a planet passing in front of the closely orbited star causes a minimal drop in its brightness.

The success of the OGLE project is a discovery of more than a hundred exoplanets (more cautiously: low surface brightness objects), including a discovery of the first rogue (nomad or free-floating) planet, the first planetary system resembling the Solar System and the smallest – at the time of detection – Earth-resembling exoplanet. The team was the first to prove (2012 publication in Nature magazine) that in our galaxy planets are much more a rule than an exception. Some recent estimation suggest at least one planet, on average, orbiting around each star, and up to 100,000 times more free-floating planets than stars in our Milky Way. And our Galaxy may consist of even 400 billion stars.



Polish telescope in Las Campañas in Chile. The Warsaw Telescope has a diameter of only 1.3 m, but its quality, equipment (above all the camera) and the manner of operation allowed for world-class discoveries, 2012

HD 209458 star and orbiting HD 209458 b planet categorised as "Hot Jupiter" – artist's impression. Hot Jupiters are planets – ubiquitous, as was proved in time – with a mass similar to Jupiter, but orbiting at a very short distance to their stars. The radiation of a Sun-like star "blows away" the lightest particles of the planet's atmosphere (hydrogen and helium) that turn into a "planetary tail" similar to a comet tail

Las Campañas Observatory in Chile. The Carnegie Institute agreed to the localisation of the "Warsaw Telescope" and other Polish astronomic devices on its premises, 2012

Professor Andrzej Udalski against a background of the Las Campañas Observatory in Chile owned by Carnegie Institute, USA, 2012

A rocky planet discovered in the framework of OGLE project: ice-cold planet OGLE-2005-BLG-390 Lb orbiting its red dwarf – artist's impression