

Queen Jadwiga Astronomical Observatory

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Private Astronomical Observatory was open in June 2015. The main aim of the observatory is to provide and share astronomical and space knowledge. It collects research instruments and expands didactic infrastructure. Continuously, there is an open call for specialists to join the Honorary Staff of the Observatory.



Fig. 1: The Orchid (*Platanthera bifolia*) – a botanical attraction of the observatory followed by general view of observatory buildings and its logo.

1 Introduction

8th of June – a reminiscence of Queen Jadwiga, was an official opening day of the private astronomical observatory in Rzepiennik Biskupi. Although the buildings are still developing and a new instruments will appear, the first scientific and educational activities have started already in 2015 – the UN International Year of Light. During the opening ceremony there were more than 300 people, among them known and recognized scientists, priests and government delegates. The event was graced by lectures of prof. Virginia Trimble, priest prof. Michał Heller and Polish cosmonaut Mirosław Hermaszewski. Polish Astronomical Society, Astronomical Observatory of the Jagiellonian University and the Astronomia Nova Association became patronates for the new observatory named Queen Jadwiga Astronomical Observatory (QJAO, in Polish OAKJ). Every month new people come and start to collaborate or support activities in the observatory.

2 Location

The observatory is located in south east of Poland, in beautifully quiet and isolated clearing among the forests of Rzepiennik Biskupi – village in Carpathian, 40 km south of Tarnów and 120 km from Kraków. 351 meters over sea level and at geographical coordinates: $\phi=49^{\circ}46'36''.16$ N, $\lambda=21^{\circ}05'22''.27$ E.

3 Objectives

The main idea of our activity is to create a new center to investigate and share knowledge about the sky, which is an environment, where we rise and enable transformation. Everyone, whose spirit tends to grow, is a nicely seen guest, student and co-worker here. This place is sacred of a huge effort of its builders and has been created to serve a noble and lofty goals. Because of restricted finances of investors, the construction of the observatory is processing slowly. The buildings have been under construction since 1998. Interested people, who are able to support the development and social mission of the observatory are highly welcome. More information is published in articles by Szaj (2015) and Wszolek (2014, 2015), and on the webside www.oajadwiga.pl.

4 Staff

The observatory is a private property of Magdalena and Bogdan Wszolek, who are building it on their own land and using their own financing. Magdalena, Bogdan and their daughter Agnieszka Kuźmicz are professional astronomers, full of passion and with dydactic skills. Agata Kołodziejczyk, the second daughter of owners, has actually a postdoc position in Advanced Concepts Team of the European Space Agency and is doing research on hibernation, time architecture and alternative bioreactors. She is very active in organizing a space science branch of the observatory. Kamil Wszolek, the son of owners, is an engineer who is a very well skilled e.g. in constructing radio antennas. Many specialists outside the family, mainly members of the Astronomia Nova Association, help as volunteers in development of the QJOA. Among them there are outstanding representatives of the national and international science. What is worth to mention, the number of honorary staff members gradually increases.

5 Scientific and educational equipment of QJOA



Fig. 2: RT-9 and RFT-5.4 in QJAO

In 2015 the observatory consisted of:

- The main building of the observatory with a lecture room, general control room, library, and several rooms prepared for astronomers work;
- Two astronomical domes for optical telescopes;
- RT-9, the parabolic radio antenna with complete steering and receiver working at 1.42 GHz. This is the second hand instrument. It was made by *Scientific*

Atlanta (U.S.A.) in 1999. From 2000 to 2010 it worked in Satellite Ground Center in Psary (Poland). In 2012 it was installed in QJOA and in 2014 the first radio photons were detected by it (Wszolek 2014);

- Radio Frequency Terminal (RFT)–5.4 meter parabolic radio antenna made by *ViaSat* (USA) in 2004 and moved in 2014 to Rzepiennik Biskupi from Komorowo where it worked for army in years 2004–2010. This instrument is waiting for revitalization (Wszolek 2014);
- Few small telescopes (the biggest one has 50 cm reflective objective) for didactical purposes;
- A set of 14 illustrated didactic plates mounted outside, so everyone can read them and learn about the most important astronomical issues;
- Small solar power station.

Observatory is situated on the area of about 10 000 square meters. On separate meadow, with an area of about 16 000 square meters, we started to organize cosmic laboratory. In 2015 special station was built to test rocket engines and rocket fuels. The first experiments on this station were carried out in the beginning of 2016.

6 Main tasks of the facility

- Educational services in the field of astronomy and astronautics;
- Research studies in the field of astronomy and space technologies on a professional level and in cooperation with international scientific centers;
- Conferences, workshops, astronomy/physics themed school trips, student internships, observations; Publishing.

7 Future plans and mission

QJAO will be continuously collecting sophisticated research instruments and tools to enable space and astronomy research on international level. In particular we are planning to build 48 m² Modular Analog Research Station M.A.R.S. to perform microgravity study. In parallel, didactic and educational programs will be developed. Radiotelescopes and optical telescopes have to be adjusted and calibrated to provide accurate astronomical data. QJAO plans to build 16m radiotelescope and 1.2m optical telescope for spectroscopic observations. QJAO will organize thematic scientific conferences and scientific sessions. Additionally, regular analysis of astronomical data from local instruments and available data bases will be performed. First scientific analog astronaut missions will be performed in September 2016. Educational activities will be developed and expanded for school students and tourists. The QJAO is open for collaboration with scientific institutions, research centers, other observatories, scientific organizations, and individual people to accelerate and improve the quality of services provided by the observatory. Contact: Queen Jadwiga Astronomical Observatory in Rzepiennik Biskupi, 33-163 Rzepiennik Strzyżewski, Poland. www.oajadwiga.pl, e-mail: bogdan.wszolek@gmail.com, tel. 518-043-166

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