

Global Astronomy Survey : Poland

First Submission : group effort with inputs from Waldek Ogloza and Bozena Czerny [see human resources section] 15 July 2009

SPoC Approval : No

1. Professional (Research) Astronomy:

1. Number of universities offering Astronomy (and their names): 6

Unlike other countries, six Polish universities (Krakow, Poznan, Torun, Warszawa, Wroclaw and Zielona Gora) have dedicated 5 year masters-degree studies in astronomy. These are very similar to those for physics, with the differences appearing in the 4th

and 5th

year courses. Graduates who wish to stay in the field of astronomy may find jobs at astronomical observatories, planetariums, or move on to PhD-level courses. Some of them also find jobs at primary and secondary schools, as teachers of physics, computer sciences or mathematics

2. Number of universities offering Physics (and their names): 27

Uniwersytet Gdański (Gdansk)
Uniwersytet Jagielloński (Cracow)
Uniwersytet im. A.Mickiewicza (Poznan)
Uniwersytet Pedagogiczny (Cracow)
Uniwersytet Łódzki (Lodz)
Uniwersytet Opolski (Opole)
Uniwersytet Rzeszowski (Rzeszow)
Uniwersytet Śląski (Katowice)
Uniwersytet Szczeciński (Szczecin)
Uniwersytet im. M.Kopernika (Torun)
Uniwersytet Warszawski (Warsaw)
Uniwersytet Wrocławski (Wroclaw)
Uniwersytet im. M.Curii-Skłodowskiej (Lublin)
Uniwersytet im. J.Kochanowskiego (Kielce)
Uniwersytet Kazimierza Wielkiego (Bydgoszcz)
Uniwersytet Zielonogórski (Zielona Gora)
Akademia Pomorska (Slupsk)
Akademia im. J.Długosza (Czestochowa)

Akademia Podlaska (Siedlce)

Technical Physics:

Akademia Górniczo-Hutnicza (Cracow)

Politechnika Rzeszowska (Rzeszów)

Politechnika Częstochowska (Częstochowa)

Politechnika Lubelska (Lublin)

Politechnika Krakowska (Cracow)

Politechnika Śląska (Gliwice)

Politechnika Warszawska (Warsaw)

Politechnika Wrocławska (Wrocław)

1. Number of academics who have been trained in Astronomy (ideally with their names and levels of qualification)

~200 persons / ~100 PhD or higher

1. Number of astronomical facilities (observatories, telescopes, etc) and as much detail about each as possible (websites/contact details):

The following 5 observatories have one or more research-grade telescopes typically of < 1m diameter.

Mt. Suhora Astronomical Obs. (primary instrument 60cm) www.as.up.krakow.pl

Warsaw University Astr.Obs. (60cm + 1.3m in Chile) www.astro.uw.edu.pl

Torun University Radio and Optical Astr.Obs (90cm + 32m radio telescope in the European VLBI Network) www.astr.uni.torun.pl

Poznan University Astr.Obs. (60cm) www.astro.amu.edu.pl

Wrocław University Astr. Obs. (60cm) www.astro.uni.wroc.pl

Jagiellonian University Astr.Obs. (50cm + 11m solar radio telescope) www.oa.uj.edu.pl

Poland also has a share in the South African Large Telescope (SALT).

The following observatories have smaller amateur-grade telescopes of 20-30cm diameter, but which are also used for research projects.

Univeristy of Zielona Gora Astr.Obs astro.ia.uz.zgora.pl

Kielce University Astr.Obs www.pu.kielce.pl/ifiz/za/

Opole University Astr.Obs. www.draco.uni.opole.pl/~bgrab

There are also approximately 10 planetariums in Poland, the largest of which are in Chorzow (in Silesia), Olsztyn and Torun. They organize daily performances, often with a topical theme.

The Chorzow planetarium is also one of the main organizers of the annual Astronomy Olympiad for high-school students. The Olympiad consists of three levels of competition. During the first, elimination, stage the pupils solve 8 astronomical problems at home and send the solutions to the organizers. The second and third parts of the competition are performed under controlled conditions, during which the pupils have to solve usually six astronomical or astrophysical problems. The winners of the national Olympiad were selected to take compete in the International Olympiads on Astronomy and Astrophysics (IOAA) in Thailand (2007) and Indonesia (2008).

Planetariums:

Chorzow: www.planetarium.chorzow.net.pl/

Frombork: www.frombork.art.pl/Pol08.htm

Grudziądz: <http://www.man.torun.pl/~mjsz/Grudziadz/planetarium.html>

Olsztyn: www.planetarium.olsztyn.pl/

Torun: www.planetarium.torun.pl

Czestochowa: www.planetarium.ajd.czyst.pl

1. Self evaluation (according to the different phases above, how would you rate your country in terms of Professional Astronomy? Please include any other relevant information to motivate your choice.)

*“Phase 1” ***well established*** country with links to the International Astronomical Union (IAU) and functioning astronomy research and outreach communities/activities/programs.*

2. Public Understanding of Astronomy:

1. What governmental astronomy/science outreach programmes for the public take place (co-ordinated either by government departments or national facilities)

The Astronomical Center of the Polish Academy of Sciences in Warsaw, as well other Polish astronomical observatories (e.g. Poznan University Observatory), have periodical public lectures through the year, given by members of staff. These are usually very popular. There are also annual 'Science festivals' in a number of cities organized by the universities and institutes in those cities (Warsaw, Krakow, Poznan and others). During these 'Festivals' public lectures, seminars, observing opportunities, experiments and demonstrations are presented to the general public, and also attract wide popular interest.

1. What non-governmental astronomy/science outreach programmes for the public take place (NGO activities or international programmes that your country is involved in)

None.

1. Comment on the presence of astronomy in the media (TV, radio, newspapers). Is it very prominent? Are there specific programmes on astronomy? Is the media generally willing to publish news on astronomy?

Astronomical and space news appears in the media reasonably frequently, particularly if it is in some way 'spectacular'. However there are currently no regular programmes dedicated to astronomy.

1. Comment on the presence of astronomy/science in the general culture of the people. Are there any specific challenges or setbacks? Is astronomy a welcome subject of conversation?

There is a general awareness of science (even if details are 'fuzzy') and public attitudes to science are generally positive. Famous historical scientists such as Copernicus or Marie Curie are well-known. Astronomy is a welcome subject. However, there have been significant cuts in the amount and level of science taught in schools, and science is generally not seen as a good career prospect by young people. There has also been a collapse in the activity of scientific

clubs and societies, and very few remain active.

1. Self evaluation (according to the different phases above, how would you rate your country in terms of Public Understanding of Astronomy? Please include any other relevant information to motivate your choice.)

The situation is still reasonable, however noticeably worse and deteriorating among school-age children and students (largely due to the cuts in the teaching of astronomy – the current programme has about 20% of the time allotted to physics, mathematics etc as 10-15 years ago.)

It is not a firm Phase 1, but perhaps somewhat better than Phase 2. So either Phase 2, or something like Phase 1.5 if we can use such intermediate cases.

3. Astronomy in Schools:

1. What governmental astronomy/science education and outreach programmes for schools take place (co-ordinated either by government departments or national facilities)

Several astronomical institutes (for example, the Astronomical Center of the Polish Academy of Sciences) organise special 2 to 3 day seminars for teachers.

1. What non-governmental astronomy/science education and outreach programmes for schools take place (NGO activities or international programmes that your country is involved in)

Teachers and their pupils at a number of schools are very active in the international *Hands-on Universe* project, both using the opportunities and materials provided by the project, and creating new material which is then shared with the rest of the community.

Since 2007, dedicated conferences for teachers are organized by the *Młodzieżowe Obserwatorium Astronomiczne*

(Youth Astronomical Observatory) in the small town of Niepolomice, near Krakow. The conferences include lectures given by research scientists;

laboratory exercises, and astronomical observations.

1. Comment on the presence of astronomy in the school curriculum. Is it part of the school curriculum? Is it very prominent? What age groups?

Elementary schools

Some astronomical information is presented to pupils (grades 4-6, about 10-12 years old), as part of a subject called 'The Environment'. Only general information on Earth and Solar System is presented.

Secondary Schools ('gymnasium' & 'lyceum')

Astronomical and astrophysical concepts are included in two subjects: *Physics* and *Geography*. The first includes such topics as: telescopes; the kinematic and physical properties of the Solar System;

the principles of cosmology and so on. The second subject deals with the celestial sphere, coordinates of celestial bodies, time, the problem of determination of latitude and longitude, the Earth as a planet, and similar topics. In addition, some topics from the history of astronomy (Copernicus, Brahe, Galileo) appear on the syllabus of history classes. Teachers are graduates of physics (or geography, as appropriate) and usually are not specialists in astronomy or astrophysics.

iv. Comment on the status of astronomy/science in schools. Are there any specific challenges or setbacks? Sufficient number of students studying maths and science? General

interest in maths/science/astronomy in schools?

The major problem is that there are very few hours available for teaching physics and astronomy; not only are many topics not covered sufficiently or at all, but astronomical topics may be cut if the teacher runs out of time to cover the physics topics. Also maths education has been similarly cut, leading to first-year students of physics and astronomy having problems with concepts such as logarithms or trigonometry (which obviously are important in astronomy). Schools generally do not have their own telescopes, however most have now got internet access which can be used for remote observing and programs such as *Hands on Universe*.

Each year, pupils go on field trips / summer camps, which can be used for extracurricular activities such as astronomy (these camps are in the countryside, so relatively dark skies are available).

During IYA2009 events so far, we have noticed that there is much greater interest in astronomy from children from small towns and villages than from those from cities.

1. Self evaluation (according to the different phases above, how would you rate your country in terms of Astronomy in Schools? Please include any other relevant information to motivate your choice.)

“Phase 2” – a limited programme of astronomy exists in schools but due to the cutbacks described above it is ***in need of support*** to increase knowledge and awareness of astronomy in schools. This then affects university applications as potential students see astronomy and physics as something difficult and alien and do not apply – applications are at a level of about 10% of the level which the universities could support.