Chapter 154

Astronomy and education

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Pedro Arthur de Lorenzo Petry
petry.pedro@hotmail.com
Universidade Tecnológica Federal do Paraná, Guarapuava, Paraná, Brasil

Ana Lucia Ferreira
alferreira@utfpr.edu.br
Universidade Tecnológica Federal do Paraná, Guarapuava, Paraná, Brasil

Gabriel Salles do Amaral
gs.amaral20@gmail.com
Universidade Tecnológica Federal do Paraná, Guarapuava, Paraná, Brasil

Marcela Alves Domingues
marceladomingues@alunos.utfpr.edu.br
Universidade Tecnológica Federal do Paraná, Guarapuava, Paraná, Brasil

ABSTRACT
The Astronomy and Education project offers students the opportunity to participate in activities related to teaching and dissemination in Astronomy. Among the objectives presented in this perspective are: consolidate and expand scientific knowledge in the Guarapuava community; contribute to the improvement of the student's scientific learning; promoting nocturnal observation schedules; provide didactic material for lectures and practical workshops containing theoretical concepts appropriate to the student's level of education. These activities were: nocturnal observations with telescopes, as a way to reduce the distance between the student and Astronomy. Observations were made in several educational spaces, in addition to the university; speeches and exhibitions. With that it was intended to stimulate and awaken in the students, both university students and elementary and high school, scientific vocations and provide an increase in interest in Astronomy. By engaging in the design of project activies, it is expected to encourage students to expand their horizons of knowledge, as well as to bring positive results to the school comunity.

Keywords: Teaching, Astronomical observations, Scientific dissemination.

1 INTRODUCTION

Astronomy is a science as old as man himself. The beauty of the night sky is a common experience for people of all cultures, something we have shared with all generations since prehistoric times (DAMINELI; STEINER, 2010). Astronomy is a topic that generates interest, questions. The teaching of Astronomy and its interdisciplinary perspective involving knowledge of Chemistry, Physics, Mathematics and Biology motivates and stimulates interest in science at any level of education (NOGUEIRA; CANALLE, 2009). Additionally, the teaching of Astronomy is important mainly to establish a relationship between the student and the physical world that surrounds him, in a dimension that goes beyond his immediate surroundings (PICAZZIO, 2011). Due to the abstract nature of the theme, it should, as far as possible, be experienced in a practical and concrete way.

The Astronomy and Education project offers students the opportunity to participate in activities related to the teaching and dissemination of Astronomy, a science that has numerous implications that directly affect our daily lives, whether cultural or technological, for example: the launch of satellites that

allowed a immeasurable evolution in the area of telecommunications, manned space travel that allows research in space has brought, and continues to bring, important conclusions in several lines of study.

Another important aspect of the modality in which the project fits is the University's mission to approach the community and the realities in which the institution is inserted, contributing to the improvement and social, economic and cultural development. It should be noted that even the Guarapuava campus having started its activities in its own headquarters in february 2014, it still needs to strengthen its relationship with the community, in addition to establishing its name as an institution of higher education.

The Astronomy and Education project comprises a set of actions to support, disseminate and publicize Astronomy, through motivating activities that are inserted as extracurricular complementation, contributing to the intellectual, social and cultural development of the school community. Among the objectives presented in this perspective are: to consolidate and expand scientific knowledge in the community of Guarapuava; contribute to the improvement of the student's scientific learning; promote nocturnal observation schedules; encourage the exchange of information through meetings for astronomical observations; provide didactic material for lectures and practical workshops containing theoretical concepts appropriate to the student's education level.

2 MATERIAL AND METHODS

All project activities were planned and carried out by the participating students, under the guidance of the coordinating teacher. These activities sought to establish conditions for meaningful learning to occur. These activities were:

a) nocturnal observations with telescopes, as a way of reducing the distance between the student and Astronomy. Observations were carried out in other educational spaces, in addition to the university;

b) workshops in partnership with schools or other institutions;

c) lectures on a specific topic;

d) exhibitions.

3 RESULTS AND DISCUSSION

With regard to nocturnal observations, these were carried out in various spaces, in addition to the university. Observations were made at the university on several occasions: with students of the 1st year of Journalism at UNICENTRO (State University of the Midwest); with third-year high school students from Colégio Estadual Professora Dulce Maschio, during Asteroid Day; with third-year high school students from Colégio Estadual Visconde de Guarapuava during the International Moon Observation Night (InOMN 2019) and with third-year high school students from Colégio Estadual Padre Honorino and Colégio Estadual do Campo Professora Maria de Jesus Pacheco Guimarães, during ExpoUT 2019. Outside the university space, observations were made at the 2nd Knowledge Fair held at Colégio Estadual Professora Dulce

Maschio and at the Star Trek held in celebration of the 35th anniversary of the Guará Puava scout group, in a farm belonging to the group.

The activity developed together with the 1st year students of the Journalism course at UNICENTRO consisted of the presentation of our extension project on Astronomy; information about location in the night sky, observation instruments such as binoculars and telescopes; Information about Astrophotography. Journalism students should write an article about these activities.

With the students of the third year of high school at Colégio Estadual Professora Dulce Maschio, activities related to Asteroid Day were carried out, which consisted of a lecture, exhibition of 3D models of some asteroids and also observation of the night sky. Asteroid Day is an international date established by the United Nations General Assembly, as June 30 of each year and is intended to alert the planetary community about the threat of a catastrophic impact by an asteroid.

Figure 1 – Night observation with the 1st year students of the Journalism course at UNICENTRO.

Source: Grupo Orion de Astronomia Amadora UTFPR GP (2019).

Based on this activity, the project's students were invited to help the students of Colégio Dulce in research on the subject of Astronomy, for subsequent presentation at the 2nd Knowledge Fair, at the aforementioned college. During the fair an astronomical observation was carried out.

Activities related to the International Night of Observation of the Moon (InOMN), were carried out with third year high school students from Colégio Estadual Visconde de Guarapuava), which consisted of a lecture about the Moon and also observation of the night sky, mainly observation of our natural satellite. International Moon Observation Night is a worldwide celebration of lunar science and exploration, celestial observation, and our cultural and personal connections to the Moon. The International Moon Observation Night has been held annually since 2010. In 2019, the International Moon Observation Night coincided with World Space Week. World Space Week is held annually from the 4th to the 10th of October. The theme for 2019 was "The Moon: Gateway to the Stars".

Participation in ExpoUT 2019 at the Guarapuava campus.

Figure 2 – Astronomical observation during ExpoUT 2019 at the Guarapuava campus.

Source: Grupo Orion de Astronomia Amadora UTFPR GP (2019).

Participation in the Star Trek event held in celebration of the 35th anniversary of the Guará Puava scout group. 3 groups of different ages were assisted: Cubs aged 7 to 10 years; Scouts aged 11 to 14 and seniors aged 15 to 17. In addition to the answers to various questions about Astronomy raised by the groups, an astronomical observation was carried out.

Considering all the events and activities carried out and described above, a total of 322 people were attended throughout 2019.

Regarding the nocturnal observations, the public received them with enthusiasm and curiosity and there was great satisfaction in observing the stars, such as the Moon, Venus, Mars, Jupiter and Saturn.

An important aspect of all the activities carried out is that they fit the University's mission of getting closer to the community and the realities in which the institution is inserted, contributing to the improvement and social, economic and cultural development.

Figure 3 – Star Trek of the Guará Puava scout group.

Source: Grupo Orion de Astronomia Amadora UTFPR GP (2019).

Due to the pandemic in 2020, the activities developed were the preparation of written materials, study of montages for Astrophotography, publication of news and information about Astronomy in the project group at https://www.facebook.com/groups/1531224043780865 and observations astronomy without an audience.

4 CONCLUSION

The study of Astronomy has numerous implications directly in our daily lives, whether cultural or technological. With this project, students were offered the opportunity to participate in astronomical observations and activities

linked to teaching and dissemination in Astronomy.

It was intended to stimulate and awaken in students, both university and elementary and high school, scientific vocations and provide an increase in interest in Astronomy.

Through involvement in the development of project activities, it is expected to have instigated students to expand their horizons of knowledge, in addition to bringing positive educational results to the school community.

The Astronomy and Education extension project was successful in fulfilling the social and educational role of awakening scientific interest in the Guarapuava city community, considering the number of contacts from schools and other entities linked to education. The city was lacking in this type of activity, since only the other public institution of higher education in the region does something similar.

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