

OBSERVATORY OF SHIRAZ UNIVERSITY

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Here we write about the observatory of Shiraz University, which has the largest active telescope in Iran but now, because of problems like light pollution of the nearby city and exhaustion of its largest telescope we need a plan for modernization and automatization in a new place.

1. INTRODUCTION

The offer for establishment of Abu Reyhan Al-Biruni Observatory was proposed at the institute of advanced education and basic sciences center in Zanjan by Prof. Yousef Sobooti and Dr. Edward Francis Guinan in 1969. The operation of construction of this observatory started in 1973 and it started operating on March 1977.

2. ACTIVITIES

The activities of Abu Reyhan Al-Biruni Observatory are divided into two research and educational units. The observatory professional research unit may be classified into practical and theoretical sections. The observatory astronomers are working with telescope and various data-collection devices such as photometer and CCD camera in practical unit by defining an observatory project and residing in observatory during one or more nights (sometimes for a few months) and they gather astronomical raw data. Then observatory practitioners acquire the given scientific results by data analysis. The photography operation is done by CCD and other miscellaneous observation activities in this observatory. In theoretical studies unit, it is worked on astrophysical theories, cosmology, particle astronomy in several fields such as binary systems, structure of neutron stars, stellar dynamics, general relativity, and black holes. With execution of activities autogenously and using observatory facilities in educational unit, students of Bachelor's Degree of physics deal with learning astronomy and acquisition of practical skills in this regard. Abu Reyhan Al-Biruni Observatory welcomes public visits (including academic and school students and other people). Primarily with attending in gathering all and using simulation

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Fig. 1. Dome of 20 inches Cassegrain telescope. Photo by: S. M. S. Kazemi.

software and attractive astronomic clips etc. the visitors pass brief trainings about celestial bodies and then they visit different units of observatory and finally they observe the existing celestial bodies of sky by means of a telescope (8 or 12 inches).

3. OTHER ACTIVITIES

1. Proposing consultation regarding activities in observatory and astronomy.
2. Participation in preparation of radio-TV programs for Islamic Republic of Iran Broadcasting (IRIB) about astronomical events.
3. Participation in determining Islamic prayer times.

4. SOME OF THE EQUIPMENTS

- A set of reflecting telescope (20 inches) of Cassegrain type (second greatest telescope in Iran) made by US Astro-Mechanics Company.
- A photometer (Model: RCA-4509).
- Three motorized spherical domes one 4.3 meter made by US Ash-Dome Inc and two 3 meter made by Shiraz Akhtarnama Company.
- 8 reflecting telescopes of 14 inches to 80 millimeter.
- A Newton reflecting telescope of 4.5 inches.



Fig. 2. domes of 11 and 12 inches telescopes. Photo by: S. M. S. Kazemi.

- Two CCD devices (DSI model) - US Meade brand.
- A Schmidt camera 8 inches (specific for photography) - US Celestron brand.
- A Sky-Scout device.
- A GPS device (Garmin brand).
- A spectrometer device (model: Spotz).
- Five sets of computers.
- Two sets of celestial spheres for educational purposes.
- Two sets of aggrandizement for printing colored and black and white photos.
- Several volumes of night sky atlas.
- A few reliable astronomical almanacs of previous years.
- 120 volumes of books.
- 200 volumes of journals.

Abu Reyhan Al- Biruni Observatory delivered the first graduate in doctorate's degree of astrophysics to few members of astronomical community of that time in 1993. According to the existing statistics, more than 10 doctorate students and also over 50 M.Sc. students have so far graduated from this observatory in various majors of astrophysics, particle astronomy, and cosmology. Some members of this observatory are also members in International Astronomical Union (IAU).

5. SITUATION AND DIFFERENT PARTS OF OBSERVATORY

Abu Reyhan Al- Biruni Observatory has been constructed on zone of Shiraz University and on top of a hill well-known as Eram hill (at north Shiraz) situated in longitude ($52^{\circ}, 30', 16''$) and latitude ($29^{\circ}, 39', 01''$) and 1740 m higher than open sea level and 180 m from the general level of Shiraz city. The

observatory was built in a fenced land with surface area of 3000 m^2 and substructure with area of approximately 400 m^2 in 3 stories. The construction of the main building of the observatory is hexagonal. The building of observatory has been constructed with a very consolidate reinforced concrete because Shiraz city is situated on earthquake fault line so that it can tolerate an earthquake up to 8.5 degree on Richter scale. The design of the observatory possesses unique architectural features and enjoys special beauty and splendor.

6. STATUS QUO

The distance of the observatory was about one kilometer from the nearest surrounding building at the early period of establishment in 1977 but due to development of the Shiraz University as well as private constructions in the locality around this university the distance of this center becomes lesser from sky pollutant sources and this will be deemed as threat for observation activities in this observatory. Nevertheless, the proximity of observatory to the Shiraz metropolis and expansion of this city during 3 recent decades and rising light pollutions and smoke contamination in this city have exerted adverse effects on observations and research at this center. The problems of the observatory are not limited to external factors but this center is at tragic status instrumentally as well. With approximate 40 years of the main telescope of this observatory is not in adequate condition because of wearing and frequent overhauls and also some of other telescopes and devices stopped working similarly and/are on the verge of retirement.

7. FUTURE PLAN

But the presence of the aforesaid problems does not lead to lack of activity in this observatory. At the same time there are some projects for improvement the condition of this observatory more than ever. One of them is the construction of a new observatory in the zone of Doroodzan Dam at 50 km of northwest of Marvdasht town in Fars Province. It has been decided to equip this observatory with an automatic and robotic system so that not only students of this university but also observatory practitioners throughout the world would be able to observe their given celestial bodies via internet network.

REFERENCES

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