

A Jump-Start for Astronomy Education in Taiwan

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Spurred by the leaping developments of research activities (SMA, TAOS, AMIBA), Taiwan is catching up in virtually all aspects of its education in astronomy. The first astronomy research institute was established by the Academia Sinica about 10 years ago, which catalyzed within two years the first graduate school of astronomy, as well as an elaborate astronomy museum. Since then astronomy education at all levels, from colleges to primary schools, has been booming. More than a dozen universities are offering astronomy courses, and two more graduate schools will soon be instituted. Textbooks get written, and books on popular science, either translated or composed by local authors, have mushroomed on the market. I will outline these ongoing activities along with plans on the horizon.

An Interactive Approach to Planetary Orbits at Secondary Level

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I describe an interactive unit for teaching/learning planetary orbits at secondary level. The unit consists of a pre-test, activities related to the planetary orbits and a post-test. The pre-test is designed to modulate the activities to suit the needs of the students. The activities are (1) Trajectory of a particle in a gravitational field when the field is constant, and when it varies with distance (invoking a fictitious planet WonderX); (2) Plotting the orbit of a planet round the sun starting from select initial conditions and discovering Kepler's laws; (3) Plotting orbits with force laws containing terms like $1/r^3$ and $1/r^4$ and discovering precession. Students work through graded steps. To help them, simple numerical algorithms and computer programs have been developed as they are not yet comfortable with calculus. A post-test gauges the progress of the students for a possible revisit to the topic. Such units can be very effective in teaching basic astronomy in developing countries.

An Undergraduate Program for Astronomy in México

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Astronomy in México has an ancient tradition, reinforced during the twentieth century by groups working in theoretical and observational astronomy. During the 1990s, the Great Millimeter Telescope (a single 50-m antenna) has been approved, and a 6-m infrared telescope is under study. Graduate and undergraduate programs must be improved to prepare future Mexican and Latin

American astronomers to take advantage of these facilities. To meet the challenge, two traditional Mexican programs (Instituto de Astronomia-UNAM and Instituto Nacional de Astrofisica, Optica y Electronica-INAOE) are updating their graduate programs. Similarly, the Departamento de Astronomía de la Universidad de Guanajuato is joining physicists in the first undergraduate program in México in physics and engineering with an option in astrophysics. This will prepare students for industry, academia or national laboratories, either in physics or astronomy. Jobs in academia have been scarce; many students had to give up their goals after one or two postdoctoral positions. Graduate and undergraduate programs must adjust, by broadening the scope of present programs so that students are better prepared for other job opportunities. We present a B.Sc. program designed by astronomers and physicists to try to address some of these concerns and to prepare the students for either continuing with graduate studies or finding employment in an ever-changing job market. (Co-author is Victor Migenes, Guanajuato, México.)

Astronomy in Romanian Universities

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In this work we present characteristics of the Romanian higher education related to the study of Astronomy. In spite of Romanian economic problems, opportunities for Bachelor's degree, Master's degree (at "Babes-Bolyai" University of Cluj-Napoca) and Ph.D. degree are provided for students enrolled in the Faculties of Mathematics or Physics. General regulations, description of courses, research resources and job opportunities are also described and discussed in this paper.

Astronomy Education in Thailand

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Thailand is one of the developing countries which tries to advance its economy, technology and science. Education in astronomy is considered a supporting factor; astronomy is a basic science from which the young generation can learn to understand and to conserve mother nature and at the same time develop analytical thinking. The poster reports the present developments in astronomical education in Thailand which includes (1) current astronomy education in school and university; (2) educational activities outside school; (3) development of programs for teaching astronomy in school (including teacher training); (4) the access of educational resources via internet. Proposals for future development and collaborations will be presented and discussed. (Co-authors are B. Soonthornthum and T. Kirdkao.)