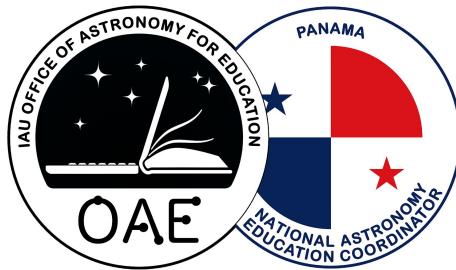


# Astronomy Education in Panama



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This overview is part of the project "Astronomy Education Worldwide" of the International Astronomical Union's Office of Astronomy for Education.

More information: <https://astro4edu.org/worldwide>

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**Structure of education:** The base of education has not changed much for 20 years. First level general basic education for elementary school is aimed at students between 6 - 12 years old, & pre- middle school, 13-15 years old [1st to 9th grades]. Middle or second Level of Education is aimed at students between 16-18 years old [10th to 12th grades]. All courses are given in Spanish language only, even though English is taught at a *very basic* level. Almost all public schools are managed by the government. There are few private ones, mainly in the city. The densest part of our population lives in the capital, so most of the educational centers are located there. All of them follow the educational curricula approved by the government. The third level is for University and Postgraduate careers.

**Education facilities:** Constitute both the physical infrastructures and the personnel trained for teaching. According to the latest national census (INEC 2017), there are currently 1,662 schools for the pre-school and elementary first level, 3,116 for primary education, 442 for pre-middle and secondary education, 24 university institutions and 41 non-university technical institutes, all distributed throughout the country. Almost all have only the basic requirements to function: electricity, running water, accessibility, cafeterias, gymnasiums, administration buildings, classrooms, etc. There're 3,466 teachers for the preschool level, 16,780 for primary, 15,181 for pre-middle and secondary, 8,444 university teachers, and 978 teachers for non-university education, technical level. For primary education there are on average 24 students per teacher. Many educators [10,103] only have a technical level. In pedagogy, 2,594 have a Bachelor's Degree in Primary Education, and 3,583 have other university degrees that are not directly related to Education. For secondary education there are on average 16 students per teacher. Among these teachers, there are 12,520 who have the title of Secondary Education Professor, and 1,671 have other university degrees outside of Education. Even though regular-speed Internet is available across the country, ~28% of hinterland schools haven't yet integrated it in their daily activities, for different reasons: mainly due to lack of financial support & poor/irregular/inefficient building-maintenance.

**Governance and organisation:** The Ministry of Education ([MEDUCA](https://ester.meduca.edu.pa)) is the central governmental institution in charge of all aspects of education. The academic calendar is divided into three trimesters: the 1st from Mar to May, the 2nd from Jun to Aug, & the last from Sep to Dec. Despite the fact that many general goals have been achieved in the educational area (<https://ester.meduca.edu.pa>), the priority has not been to strengthen Basic Sciences. The COVID-19 pandemic made possible the creation of virtual courses, but none aimed to teach Astronomy. MEDUCA's educational curricula is mandated to all schools (public & private).

**Teacher Training:** There's no educational governmental infrastructure to train teachers in Astronomy, so far. Panama hasn't a formal "astronomy education community", only amateur clubs. The AAG (Astronomy & Astrophysics Group @ Physics Dept., Univ. of Panama UP), created since 1998, has been the only active group, to date, in the training of teachers/professors in the area of Astronomy. Thanks to Panama's integration into the IAU [2009], Panama's NCA (formed by AAG members) has been responsible for ~94% of all the advances achieved so far in Astronomy education. The goals of the IAU OAE have always been the goals of the AAG-NCA from the beginning. The AAG-NCA has reviewed the use of Astronomy to lure more public into science, but MEDUCA hasn't formalized those recommendations so far. Financial and Human Resources are few, and what can be achieved one year, can not be sustained next year. More comprehensive overview: <http://iau-panama.ac.pa> [under construction]. Recently [2015], the National Secretariat for Science & Technology - SENACYT has increased financial investment in Science and Technology, which has helped us promote Astronomy on many levels. The AAG-NCA has been creating astronomy diploma courses [2 semesters only], seminars, training for teachers/professors of all levels; international conferences with guest professionals, for the public; have organized IAU NASE courses to train elementary and pre-middle school teachers; have published many divulgation articles in local newspapers. In 2003, the "Space & Earth Sciences" course (Phys.303) was created in the UP Physics Dept. to train teachers (<http://iau-panama.ac.pa/astropa2009/centroamerica.html>) for secondary level schools. Thanks to all these efforts, now Panama has a Galactic Astronomy project (<https://snorri.space>), which has also helped to bring astronomical education to the hinterland. But, although the young population's interest in Astronomy is good, teachers/professors in general are not well motivated to keep on learning. English is a major obstacle.

**Astronomy in the curriculum:** Astronomy is not yet part of the MEDUCA educational curriculum. In general, extremely very basic Astronomical concepts are touched shallowly as a part of the "Natural Sciences" course: introduction to our Solar System, stars, galaxies, etc. This course is mandated from the 1st grade, primary/basic level, to the 3rd grade, secondary level (9th level in some countries), but Astronomy starts at the 3rd grade, primary/basic level. And it's been reported that most teachers don't have enough time to cover it satisfactorily. Human resources who are adequately trained to teach regular Astronomy school classes, at any level, almost do not exist.

**Astronomy education outside the classroom:** Our country is extremely small. The financial resources and Astronomy formally trained personnel are very few. However, the greatest achievements in the outreach of Astronomy to the public, has been made by non-professional clubs & private initiatives. To our knowledge, there are only 3 non-professional clubs, each with approx. 15-25 members. Star parties are only planned during the very short summer season [due to our harsh weather]. Only the club in the capital has members who are very interested in this science, to the point that some of them have invested a considerable amount of money to buy sophisticated advanced equipment. Thanks to them, the Panamanian Observatory of San Pedro de Atacama (OPSPA) was created, in Chile, and it's managed remotely from Panama, producing very important fruits of excellent scientific quality (<http://apaa.org.pa>). Also, a private non-lucrative company (ASTRANOVA) have a small plastic dome planetarium that has been used several times. There's another private group that has a mobile observatory, which has been used to bring astronomy to the interior of the republic.

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