



NEWSLETTER

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EDITORIAL

After its inception in 2010, NASE is implemented in over twenty countries. Now it's time to recognize the job well done by local groups, when they organize courses. With this annual award, we want to acknowledge this work.

In 2015 this prize has been awarded *ex aequo* to:

- The Local Group of Nicaragua, for the course in Managua from 13 to 15 July, in collaboration with the Observatory of the Universidad Autónoma Nacional of Managua.
- The Local Group of Honduras, for the course in Tegucigalpa from 24 to 27 August, in collaboration with the Observatory of the Universidad Autónoma Nacional of Honduras.

The jury wishes to emphasize that, in both cases, those courses were organized in coordination with the Ministry of Education, a large group of teachers (from all parts of the country) participated in them, all lectures, workshops, observations and visits were made, and finally, surveys of attendees valued the course very positively (as you can see on the website of NASE). In the course of Nicaragua they gave the book published, and in Honduras, the CD was distributed for all, as it is determined.

Congratulations to all members of both local groups, and especially to the coordinators of the two groups, they undoubtedly have a point of engagement with the NASE program.

Rosa M. Ros
President of NASE

COURSES

AWARD BEST COURSE NASE 2015

We are going to interview Ricardo Pastrana, NASE-Honduras Coordinator (H), and Ligia Areas and Noel Zelaya, NASE-Nicaragua coordinators (N).

Q. Congratulations for the award you have received for the best courses NASE 2015. We would like to know how you organize them, in order to share your experience. Since when are you doing the NASE courses? How many have you done?

N. The first course NASE in Nicaragua was held from 12 to 15 July 2010, aimed at teachers of normal schools and undergraduates from departments around the country. Since then we have completed a course every year, the 2016 course will be the seventh.



H. We received the invitation in 2011 from the presidency of NASE, Dr. Rosa M^a Ros to participate in the Network for Teaching Astronomy in the School. We accepted with enthusiasm the invitation to collaborate in a global educational project. We organized a preparatory workshop to train 16 teachers of the Department of Astronomy and Astrophysics (DAAF) of the Faculty of Spatial Sciences (FACES) of the National Autonomous University of Honduras (UNAH), which was



the local group NASE-Honduras. That summer we held the First Course, with 51 primary school teachers from different parts around the country.

In 2012 an international agreement between FACES/UNAH, Secretary of Education of Honduras and NASE/IAU was approved by the Council of Ministers in October 9, 2012, and it was renewed

in 2015 for three years more. Since then we have done a course per year, five in total, in which 251 teachers have participated.

Q. How do you announce the course to primary and secondary school teachers? What they value most?



The President of the Republic of Honduras, Lic. Porfirio Lobo Sosa signing an agreement between the Principal of UNAH, Misc Julieta Castellano (left) and the Minister of Education, Dr. Marlon Escoto (right)

H. We announce the course through the Ministry of Education (Ministry of Education), which is responsible for selecting teachers, taking into account a profile that has been previously established between the Commission NASE-UNAH and Secretary of Education. What they value most is that it is not a course with long theoretical sessions, but rather a very practical course. In fact, the activities most valued in the final polls are the workshops.

N. We request an audience with the Vice Minister of Education to coordinate the dates of the course. And then a letter is sent to the directors of all schools around the

country, confirming the decision of the Ministry of Education (MINED). In 2015 it was coordinated with the Faculty Multidisciplinary, Carazo (Carazo FAREM) to ensure logistical support to the attendees. And certainly, what they value most is that it is a very practical course.

Q. The dates are often important. What is your experience in this field?

N. The course is scheduled trying not to interfere with the normal course during the school year.

H. We have organized workshops at different times of the year, but assessments made on the participating teachers tell us that the workshops that develop in mid-year are better by them. This is because the curriculum indicates that the subjects of astronomy should be taught for this time, and with the NASE course, they face them with more security.

Q. In addition to the certificate NASE, the participants receive an official certificate from the Ministry of Education or other academic authorities? How do you do it? Because it is not always easy.

H. The participants receive the NASE certificate, which, according to the agreement signed with the Ministry of Education, has official recognition.

N. In the first year, the teachers get a certificate of participation issued by the UNAN-Managua, but currently we only extend NASE certificate.

Q. Who are the instructors/trainers that teach workshops? Do they need a lot of training?

N. They are teachers of the Physics Department and students of the last courses of Geophysics, that show interest in communicating the science of astronomy and astrophysics.



H. The NASE-Honduras team is formed with teachers from the Departments of Astronomy and Astrophysics, and Astronomy and Cultural Archaeoastronomy. Their current training is: 1 PhD, 11 Master and 7 Engineers.

Q. For the course, you must previously make some models, which are then used in the workshops. Is it difficult to make them?

H. It's a job without much complication. The responsables for each workshop previously made the models that are necessary.

N. Prior to the course, we conducted workshops given only to instructors and assistants. There, the models are developed. Each member keeps them for display as an example to the participants. These instructors dictate the course, and there is an assistant in each group, for helping to make the models. In 2015, before the NASE course, the conferences and workshops were given to students of the Department of Physics at the Faculty of Education, and so, we had the opportunity to train many instructors.



Q. And with respect to the material used by participants in the workshops, is it difficult or expensive to get it?

N. In our case, for workshop materials, and for feeding participants, we request assistance in advance to different agencies such as the National Council of Universities, which have supported us in five consecutive courses, and the Faculty of Sciences and Engineering of the Universidad Autónoma de Nicaragua (UNAN-Managua), provided us the material in 2015.

H. The more specialized material, for example for the projection or observations, is provided by the university. The participants bring some materials. And we put the rest.

Q. What projects do you have for the future?

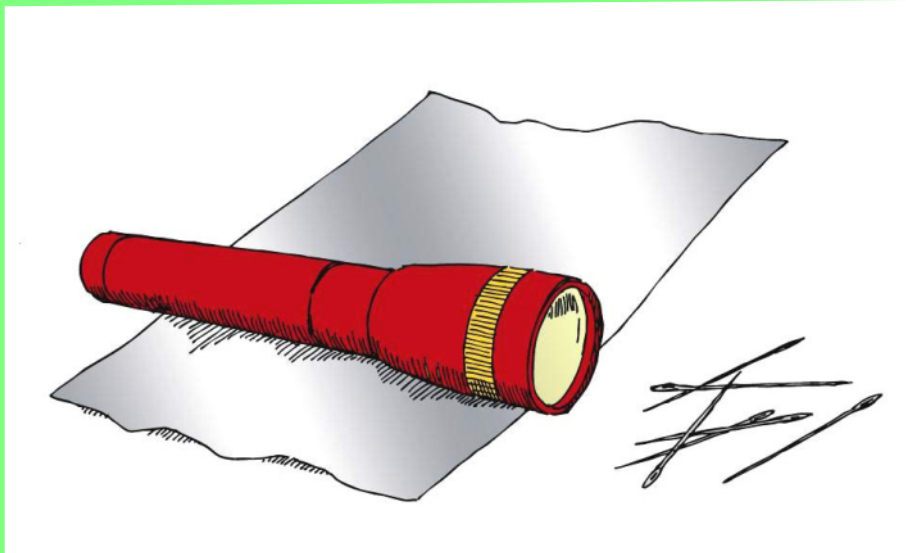
H. An idea that we raised is to conduct the workshops to other departments (provinces) of the country, as not all teachers can attend college in the capital city. But there is the problem of the availability of many trainers, because until now, each trainer was specialized in a single workshop. To avoid this dependence, we are currently conducting a Workshop focused on training 18 instructors for NASE course, which can develop any workshop to be assigned. So a small group of them can make the NASE courses anywhere in the country.



N. UNAN-Managua has four regional campuses located in the departments of Esteli, Matagalpa, Carazo and Chontales. We want to use this structure to expand coverage to those facilities NASE courses and reach new players and give them the benefit and the level that provides NASE.

MATERIAL

ESTIMATING THE DISTANCE TO A STAR WITH A FLASHLIGHT



A star is an object similar to our sun, that it is further away. Their distances are measured in light-years, which is the distance that light, at 1.8 million km/h, travels in a year. A light-year is about 10^{16} m.

To estimate the distance to a star, we can compare its brightness with an artificial star made with a flashlight wrapped in aluminum foil. We can assume that the star is as bright as our sun.

We'll need a flashlight, a ruler, a measuring tape,

aluminium foil and sewing needles.

The power P of the flashlight bulb is usually written in the socket. If not, we can measure the resistance R of the bulb with a multimeter, and calculate $P = V^2/R$, where V is the voltage of the battery power.

For making an artificial star, we cover our flashlight with an aluminum foil, in which we have previously made a hole in the central part with a sewing needle. The small hole made is a square of side approximately equal to the thickness of the needle. To measure it, you can put several needles together to make 1 cm wide: if for example there are 7 needles, the diameter of one of them will be $1/7$ cm. For that small hole will exit light whose power is $p = P \cdot a/A$, where a is the orifice area (= width of the needle x width of the needle), A is the area of focus of the flashlight and P its power.

At night, you will need the help of another person which moves your artificial star away until you see it as bright as a star in the sky. Finally, measure the distance d in meters between the artificial star and you.

You can estimate the distance D to this star assuming that its luminosity is equal to the Sun ($=4 \cdot 10^{26}$ w), and therefore:

We may calculate the D value, and pass it to light years ($1 \text{ l.y.} = 10^{16} \text{ m}$).

$$\frac{4 \cdot 10^{26}}{D^2} = \frac{p}{d^2}$$

More materials like this you can find them on the website **NASE**:

http://sac.csic.es/astrosecundaria/es/material_complementario/MaterialComplementario.php