

DIVISION C / COMMISSION 1

WORKING GROUP NETWORK FOR ASTRONOMY SCHOOL EDUCATION - NASE

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REPORT VIENNA G.A. - DECEMBER 2019

INTRODUCTION

The working Group NASE, Network for Astronomy School Education, organizes courses for secondary and primary school teachers and professors in different countries. The NASE courses are given in the language of the country, and all the material is translated with the important cooperation of the Local Group of teachers and astronomers in the country that host the course. A small group of two or three NASE members visit the country and teach the course in cooperation with the Local Group. Of course, they are invited to cooperate with NASE in other courses in different countries and preparing new materials, too. NASE cooperates with local institutions, e.g. the Ministry of Education, Universities and/or Observatories, and Teacher Associations.

NASE COURSES: CHARACTERISTICS

The NASE basic course expend 4 or 3 days. In some countries the Local Groups is more interested in a monographic course, which can be developed in only 2 days. This last proposal, was created several years ago, and consists in one short course on Spherical Astronomy and the other one, about Astrophysics.

In 2019 NASE prepared new activities related to Exoplanets and Astrobiology, including a new monographic course in Astrobiology. At the moment of this report, there is not news about it, because we begun to teach in 2020.

COURSES ORGANIZED IN THE PERIOD VIENNA- GA to December 2019

NASE organized 43 courses in the period September 2018 – February 2020. We increased the activities, starting the action in **13 new countries: Armenia, Ethiopia, Japan, Mongolia, Portugal, Puerto Rico, Russia, Salvador, Senegal, Tanzania, Thailand, Uganda and Zambia**. This was a very important effort for NASE members in a short period of time (less than 2 years).

The courses, with the detail of number, location and date, is:

160 Der es-Salam (Tanzania) - Diciembre 16-18, 2019
159 Ciudad de Rioverde (México) - Dic 13-14, 2019
158 Turda (Rumania) - Dic 10, 2019-Febrero 4, 2020
157 Lusaka (Zambia) - December 9-13, 2019
156 Cluj (Rumania) - Dic 4,2019 - 29 Enero, 2020

- 155 El Salvador (El Salvador) - November 25-29, 2019
- 154 Barcelona (España) - Nov 20, 2019-March 11, 2020
- 153 Santiago (Panamá) - November 14-17, 2019
- 152 Osaka (Japan) – Nov. 9-10, 2019
- 151 Encarnación (Paraguay) - Nov 2-Dec 14, 2019
- 150 Faro (Portugal) - Oct 23, 2019-Enero 20, 2020
- 149 Xi'an, Shanxi (China) - Octubre 21-25, 2019
- 148 Neuquén (Argentina) - Octubre 16-19, 2019
- 147 Adis Abeba (Etiopía) - Octubre 12-13, 2019
- 146 Tegucigalpa (Honduras) - Septiembre 23-26, 2019
- 145 Coaque-Manabí (Ecuador) - September 2-6, 2019
- 144 Moscú (Russia) - August 26-29, 2019
- 143 Lampung (Indonesia) - August 19-22, 2019
- 142 Mendoza (Argentina) - August 16-22, 2019
- 141 Guatemala (Guatemala) - Junio 19-21, 2019
- 140 Tsetserleg (Mongolia) - June 19-21, 2019
- 139 Chiang Mai (Thailand) - May 21-24, 2019
- 138 Mbarara (Uganda) - May 13-14, 2019
- 137 Yerevan (Armenia) - May 6-8, 2019
- 136 Dakar (Senegal) - April 22-25, 2019
- 135 Mbarara (Uganda) - April 5-10, 2019
- 134 Guadalajara (México) - April 2-5, 2019
- 133 Quetzaltenango (Guatemala) - March 14-16, 2019
- 132 Busher (Irán) - March 9-12, 2019
- 131 San Salvador (El Salvador) - February 20-22, 2019
- 130 San Juan (Puerto Rico) – February 15-18, 2019
- 129 Panamá (Panamá) - February 4-8, 2019
- 128 Barcelona (España) - January 30-June 5, 2019
- 127 Medellín (Colombia) - January 25-26, 2019
- 126 Loulé (Portugal) - December 18-22, 2018
- 125 Managua (Nicaragua) - December 11-13, 2018
- 124 Lima (Perú) - November 28-29, 2018
- 123 San Luis Potosí (México) - November 21-23, 2018
- 122 Cluj (Rumania) - September 2-November 18, 2018
- 121 Medellín (Colombia) - November 16-17, 2018
- 120 S. Antonio de los Cobres, (Argentina) - Nov 14-16, 2018
- 119 Chiriquí (Panamá) - November 12-15, 2018
- 118 Bandar Lampung (Indonesia) - October 22-25, 2018
- 117 Shantou (China) - October 14-18, 2018
- 116 Addis Abeba (Ethiopia) - October 11-14, 2018
- 115 Foz de Iguazu (Brasil) - October 3-6, 2018
- 114 Marcala, (Honduras) - Sept 22-27 Oct, 2018

In summary there are 29 courses that the respectively working group teaches their courses themselves without the support of NASE's visitors. In America only Chile and Puerto Rico need NASE visitors. Other countries can teach the courses without exterior support (Argentina, Bolivia, Brasil, Colombia, Cuba, Ecuador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Salvador, Uruguay). In other continents the situation is different. Only, some countries can teach themselves without the support of NASE visitors. That is to say, in Asia, China, Indonesia and Iran, in Europe, Portugal, Romania and Spain and finally in Africa Ethiopia can teach themselves.

For the other courses that needs NASE's visors, there were 16 members of NASE that visited other countries in order to help local working groups to teach news courses.
(for a full list of courses see NASE website)

NASE also organized several courses in cooperation: two workshops in Brazil, one in Italy and one in Spain in 2018 and 2019.

IAU 100 YEARS UNDER ONE SKY AND INTERNATIONAL DAY OF THE LIGHT NASE PROJECTS

The "Herschel Experience" was a NASE project proposed as part of the International Day of light in 2018. During half a year it was carried out by more than 50 groups in 8 different NASE countries. With a box, a prism and 4 thermometers, it is easier to observe that the Sun spectra presents different temperatures, but the installed beyond the red presents a higher temperature than the thermometer in the shadow, in all the cases. In this way, the infrared is detected.

In 2019, NASE participate of the IAU-100 Years Under One Sky celebration, proposing the "Power of the Sun" project, from autumn to spring equinoxes. This project was carried out by 16 countries and we received 482 measurements. The idea is to use the Bunsen photometer (the oil spot photometer) in order to determine the power or luminosity of the Sun. The innovation in 2019, was to prepare a setup which permits to make the experience using the face of the participant instead the oil spot. This approach to the detection, permitted the inclusion of blind people. ONCE Foundation (<https://www.fundaciononce.es/>) a Spanish organization were part of the proposal, and their results were spectacular if we compare with the other ones. This activity was organized in association with CSIC, CONICET, Beijing Planetarium, La Cité des Sciences, EAAE, NARIT and YOMO. The final event was a public exhibition of 10 countries in Spain.

PUBLISHED BOOKS

The edition and publication of the books which support the courses is also a big goal, up to the moment of this report, the available material is:

- Beatriz Garcia, Ricardo Moreno, Messages in the light of the stars, 2018, (Ed. by Albedo, Spain, in Spanish and English)
- Rosa M. Ros, Beatriz Garcia, Alexandre Costa, The power of the Sun and how to measure it, 2019, (Ed. by Albedo, Spain, in Spanish and English)
- 14 passos para o universo 2019, Ed. Rosa M. Ros and Beatriz García, Portuguese
- Beatriz Garcia, Ricardo Moreno, The distance to the stars, 2020, (Ed. by Albedo, Spain, in Spanish and English)

NASE WEBSITE

NASE educational resources and courses materials are available at the website in 13 languages: English, Spanish, Portuguese, Chinese Mandarin, Romanian, Indonesian, French, Russian, Japanese, Mongolian, Armenian and Catalan.

On the other hand, all the PowerPoint files of the course are prepared in 13 languages, and the supporting texts, word files, are ready in 6 different languages. The translation of the material in all NASE languages, is on the way.

The basic course is the same in all the planet, but we teach in each country taking into account their Latitude and Longitude. Moreover, special sessions on Cultural Astronomy and Astronomy in the City are performed, in order to showcase the uniqueness of each site. This last activity of NASE, is prepared by local astronomers in cooperation with Archeastronomy specialist, sometimes members of the IAU.2

CLOSING REMARKS

The Network for Astronomy School Education is a ISO 29990:2013 certified course in Argentina. In this country the courses are more widespread and were developed along a period of time which permits analyze the impact of the activity through indicators (19 courses in the past 7 years). The International Standards permit to assure that the course can be offer with the same level of quality, and follows the same Mission and Vision.

In this sense, the available documentation for Argentina, can be very easily extended to other countries after changing a few specific details, and now is available in English, thanks to help from NASE-Honduras.

Further information is available at <http://www.naseprogram.org>.

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