

in the explanations of the phenomena was observed. For example, there was an increase in the percentage of responses: indicating that the length of the shadows varies throughout the day (from 18.4% to 41.6%) and during the year (from 6.1% to 29.2%), depending on the position of the Sun; considering sundials as devices that permits the reading of the hours on the basis of the behavior of the shadows (from 3.1% to 29.3%); with the opinion that the sun is not daily by zenith (from 36.9% to 95.4%).

¹ Western Paraná State University, Foz do Iguaçu, Brazil (dpedm@uol.com.br).

² Support: Casimiro Montenegro Filho Astronomy Center (FPTI/BR).

OEI, GTTP AND ADVENTURERS OF THE UNIVERSE: TRAINING TEACHERS AND DISSEMINATING SCIENCE IN THE SOUTH OF BRAZIL

D. B. Pavani¹, M. F. O. Saraiva¹, and H. Dottori¹

Itinerant Educative Observatory (OEI) is a permanent program of our Department of Astronomy since 1999. It aims to lecture Astronomy to teachers of fundamental and middle levels, using attractive resources such as telescopic observations, audiovisuals, and multimedia. The training courses are requested by different cities of Rio Grande do Sul and nearby states and are organized by a local committee of the requesting city. In 2014, with federal funds, we are uniting efforts with other extension project: the Galileo Teacher Training Program (GTTP). This is an international program developed to train teachers in the effective use of astronomy education tools and resources in their science classes. The program, that is a legacy of IYA2009, aims to create a worldwide network of Galileo Ambassadors the promoters of the training workshops and Galileo Teachers the teachers who bring the learned methodologies into classroom. To supplement these activities, we initiated a new program in 2012 called Adventurers of the Universe. University professors, undergraduates students and teachers of high-school and elementary school of social vulnerable communities develop transdisciplinary didactic sequences where Astronomy is the central focus to motivate different processes of teaching and learning, considering different learning levels, designed for direct use in the classroom. The objective of the program is to contribute to the didactic transposition through the discussion about how to relate astronomy with other

science and non-science disciplines. In 2012 we collaborated with 20 teachers of one school, and 900 students. In 2013, the collaborations were expanded to include teachers and students of 3 other schools.

¹Department of Astronomy, Physics Institute, UFRGS, Brazil.

RECA: A NETWORK BY STUDENTS, FOR STUDENTS

M. C. Remolina Gutierrez¹, S. Velasco Moreno¹, P. Hoyos Restrepo¹, J. D. Jimenez Nieto², A. F. Ramos³, and J. C. Buitrago Casas³

RECA (Red de Estudiantes Colombianos de Astronomía) is a national network created by Colombian students that needed to be connected by their love for astronomy and astrophysics. It compiles most of the university groups and individuals that are willing to make part of a bigger community that gives benefits such as outreach activities, student links, and resources. This work is divided in 3 main parts. The first one is a quick review of the history of RECA since it was proposed in the III Colombian Astronomy Congress until today. After that, we review all the achievements and activities that the network has made and the people that collaborated to make it possible. Finally, we emphasize the vision that RECA has for the next years and what it can give to the development of astronomy in Latin America regarding to students flux, training and research.

¹ Universidad de los Andes, Colombia.

² Universidad Distrital Francisco Jose de Caldas, Colombia.

³ Universidad Nacional de Colombia.

BRAZILIAN PARTICIPATIONS IN THE INTERNATIONAL ASTRONOMICAL SEARCH COLLABORATION

G. A. Rojas¹, L. J. Dalla-Costa, A. T. Kalmus, E. C. Kroth, M. F. Matos, A. L. Silva, G. G. Silva

International Astronomical Search Collaboration (IASC) is an international educational project between universities, schools, observatories and research institutions. Its main objective is to enroll high school and college students in the monitoring and discovery of asteroids and Near Earth Objects (NEOs), especially Potentially Hazardous Asteroids. The methodology consists in the analysis of

astronomical images obtained in several observatories in North America and Hawaii. The images are distributed throughout the school network and the results must be delivered in a 72-hour timeframe. Since 2010 Brazilian universities and schools have joined IASC, resulting in over a dozen new asteroids found (3 of them NEOs), and hundreds of measurements for already known asteroids. A major event in this collaboration was the All-Brazil Asteroid Search Campaign, which was conducted in September 2012. 2013 marks the fourth year of Brazilian participations in IASC, with one important milestone: the third straight appearance of a Brazilian institution in the Pan-STARRS campaign, which uses the PS1 telescope in Haleakala, Hawaii. We will present a summary of the overall results, as well as the latest news from 2013 campaigns. We will discuss the impact promoted by the past events, such as how the interest in astronomy changed before and after the campaigns, and it has helped the students to choose their future careers.

¹ Universidade Federal de São Carlos, Brazil.

In summer 2012 the Italian EU-UNAWE team joined with the South African team in Cape Town, working with the township schools organizing activities at school and also a teachers' training event at the SAAO Observatory. In order to involve in the exchange not only the project's experts but also to the teachers and the children, we organized Skype connections between the Cape town teachers participating in the project and the teachers in Sicily (South Italy) that also participated in one of the Italian training sessions and later between the children of the Italian school and those in Zanemfundo School (Cape Town). Thanks to this chance of seeing each other and talking directly, children have - with huge interest and participation - shared and learned methods, experiences, curiosities. They shared their prepared actual science researches, in order to understand why an equal gnomon cast different shadows at the same time in the two countries. The teachers confronted on curricula, didactic methodologies such as working with a background story during the whole school year, interdisciplinary uses of astronomy, languages etc. The EU-UNAWE project and International or Regional conferences such as LARIM are perfect chances to create exchanges between countries all around the World, and this simple communication model between children and teachers appears like an enormous resource yet to be fully exploited.

¹ INAF - Osservatorio Astrofisico di Arcetri, Largo E. Fermi 5 - 50125 Firenze, Italy.

² South African Astronomical Observatory, Observatory 7935, Cape Town, South Africa.

SOUTH AFRICA CALLS ITALY: EFFECTIVE EXCHANGE ACTIVITY THROUGH COSTLESS (SKYPE LIKE) CONNECTIONS IN THE FRAMEWORK OF THE EU UNAWE PROJECT
A. Zanazzi¹, L. Albanese¹, and Troshini Naidoo²

LIST OF ABSTRACTS

THE USE OF THE MATHEMATICA SOFTWARE IN THE STUDY OF PLANETARY DYNAMICS
N. F. Aguero & T. A. Michtchenko 129
A DYNAMICAL MECHANISM TO PRODUCE HIGH-INCLINATIONS TNOS
P. I. O. Brasil, R. S. Gomes, & D. Nesvorný 129
STABLE LOW-ALTITUDE ORBITS AROUND GANYMEDE CONSIDERING A DISTURBING BODY IN A CIRCULAR ORBIT
J. Cardoso dos Santos, J. P. S. Carvalho, & R. V. de Moraes 130

TIDAL, THERMAL AND MAGNETIC EVOLUTION OF TERRESTRIAL EXOPLANETS IN THE HABITABLE ZONE OF DWARF STARS
P. Cuartas-Restrepo, M. Melita, J. Zuluaga, J. Hoyos, & M. Sucerquia 130
IMPROVEMENT OF TNO'S EPHEMERIS IN THE CONTEXT OF STELLAR OCCULTATIONS
J. Desmars, F. Braga-Ribas, R. Vieira-Martins, J. I. B. Camargo, & M. Assafin 130
SMALL ASTEROID FRAGMENTS IN EARTH-CROSSING ORBITS
J. Duha & G. B. Afonso