

THE SOFIA AIRBORNE INFRARED
OBSERVATORY - FIRST SCIENCE
HIGHLIGHTS AND FUTURE SCIENCE
POTENTIAL
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SOFIA, short for Stratospheric Observatory for Infrared Astronomy, is a Boeing 747SP aircraft with a 2.7m telescope flying as high as 45000 ft in the stratosphere above 99 percent of the precipitable water vapor. SOFIA normally operates from its base in Palmdale, California, and a typical observing flight lasts for 10 hours before returning to base.

SOFIA has started astronomical observations in Dec 2010 and has completed some 30 early science flights in 2011, delivering a number of exciting results and discoveries, both in mid-infrared imaging (5-40 μ m) and in far-infrared (THz) heterodyne high-resolution spectroscopy which were published in mid-2012 in special issues of ApJ Letters and A & A, respectively. Meanwhile, in July 2013, as part of Cycle 1, SOFIA has deployed to New Zealand for a total of 9 flights (all of them successful) and has observed key targets in the southern hemisphere at THz frequencies, including star forming regions in the Large and Small Magellanic Clouds.

In this talk, I will present a few highlights of SOFIA early science and its future potential, when the full suite of 7 instruments will be implemented by the time of full operations in 2015. As Herschel ran out of cryogenics in April 2013, SOFIA will be the premier FIR-astronomical facility for many years to come. Synergies with ALMA and CCAT must be explored.

SOFIA is a major bilateral project between NASA and the German Space Agency (DLR), however as an international observatory it offers observing time to the whole astronomical community world-wide, not only to the US and German primary partners.

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IC, for use in the design of a spectrometer built by students. The program was built in C++, a language in wide use today. The origin of spectra used is a simplified model of rustic spectroscopy. This equipment basically consists of a box that does not allow light to enter, except through a slit made in the side of it, a diffraction media and a camera for data acquisition. After the image acquisition, one executes the data processing, followed by the usual steps of reduction and analysis of this type of tool. We have implemented a method for calibrating the spectroscopy, through which one can compare the incidence of the photons with characteristic of each monochromatic wave. The final result is a one-dimensional spectrum that can be subsequently analyzed.

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THE LATIN AMERICAN JOURNAL OF
ASTRONOMY EDUCATION (RELEA):
CONTRIBUTIONS AND PERSPECTIVES
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The goal of this work is to present an analysis of articles published by the Latin American Journal of Astronomy Education (RELEA) since its beginning (2004) to the present. We analyzed the 59 articles available on the website of the journal (<http://www.relea.ufscar.br>), published in 15 issues. The articles were classified by: year of publication, issue, author's institutions, grade level, focus of the study and content. The results show that the number of articles is still small - although the journal has been initially qualified as B3 within the Journal Ranking scheme Qualis CAPES and in the latest ranking (current) advanced to the concept B1 in the Qualis, it is too early to expect an increase in the number of articles submitted. Among the main factors for the relatively low number of articles we can mention that the initially nominated Editorial Board did not succeed in a proper dissemination of the journal and call for papers, the ongoing absence of a "critical mass" of astronomy education researchers and the lack of publishing tradition in the area. Important aspects of the writing of articles submitted are also discussed, such as refereeing, acceptance rate of articles, participation of authors from countries other than Brazil and theoretical and methodological frameworks, as well as the recent editorial restructuring of the international Editorial

TEACHING & OUTREACH

DATA ACQUISITION SYSTEM FOR
INSTRUCTIONAL SPECTROSCOPES
C. B. S. B. Almeida¹ and A. Hetem¹

This article aims to present the software for data acquisition developed in scientific initiation program -

Board of the RELEA and the nomination of Associate Editors from Brazil. Concluding, it is possible to note the contribution to the field up to the moment through citations in other works in the field. However, it is necessary to advance with regard to: publishing more articles, articles from greater variety of Latin American countries, training of the community for a minimum quality of the writing of articles submitted for publication in a journal aimed at education research. In this sense, additional analyses of the published papers would be desirable. Finally, it is pointed out the need for greater dissemination of the journal to increase the number of submissions, encouraging the diversification of contents and methods and increase the participation of authors in general and from Latin America in particular, aiming to greater academic contribution for astronomy education at various levels and places.

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COMMUNITY SCIENCE WITH THE VVV

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We are developing a web framework for community-science projects with the Vista Variables in the Via Láctea Survey with applications that includes: Identification and Classification of candidate galaxies and transients within them; Classification of light curves; Monitoring of the galactic centre; Monitoring of some solar system objects. The first phase of this project involves the eyeball detection/ classification of galaxies and the monitoring of supernovae and is being developed in python as part of Juan Bautista Cabral's PhD thesis.

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ALFABETIZACIÓN EN ASTRONOMÍA DE DOCENTES DE EDUCACIÓN PRIMARIA Y DE EDUCACIÓN SECUNDARIA EN LA PLATA

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La educación de este siglo tiene como uno de sus retos alcanzar la alfabetización científica de todos los ciudadanos para que comprendan y tomen decisiones sobre el mundo natural y sus cambios originados por la actividad humana utilizando el conocimiento científico. En esta misión los docentes de los niveles obligatorios de enseñanza juegan un papel clave por su rol de agentes multiplicadores del conocimiento. Se requiere, entonces de una adecuada alfabetización en ciencias de los docentes o, como mínimo, que dominen los temas científicos a enseñar.

En el campo de la Astronomía, numerosas investigaciones han señalado que maestros de primaria y estudiantes de profesorado poseen una escasa formación en estos temas (Camino 1995 y 1999, Gangui 2010), que frecuentemente presentan a los alumnos concepciones alternativas o no científicas de los fenómenos astronómicos cotidianos (Kriner 2004, Vega Navarro 2007, Gangui et al 2010); a lo que se suma la presentación confusa o errónea de algunos temas astronómicos en los textos escolares (Kriner 2004).

Desde 2011, la Facultad de Ciencias Astronómicas y Geofísicas, UNLP, ofrece un curso de capacitación destinado a fortalecer y actualizar los contenidos académicos y didácticos de los docentes del distrito La Plata utilizando diversas estrategias didácticas. Los contenidos comprenden los temas astronómicos de los diseños curriculares vigentes.

La evaluación diagnóstica de los conocimientos previos de los docentes cursantes sobre los contenidos de mayor presencia en los diseños curriculares mostró resultados similares a las investigaciones arriba mencionadas. Referente a los movimientos de la Tierra, en promedio, el 54% poseía conceptos erróneos y el 16% no los sabía; con referencia a la Luna el 56% poseía conceptos erróneos y un 4% no los sabía. Los resultados del curso mostraron que el 95% de los docentes revirtió sus conceptos previos erróneos, que adquirió criterios para la búsqueda de fuentes de información confiables y que el grado de conocimientos disciplinares y didácticos alcanzados por los docentes garantiza el efecto multiplicador de esta propuesta.

Esta capacitación fue acreditada con puntaje por el organismo educativo provincial en 2011, 2012 y 2013.

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