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ABSTRACTS OF CONTRIBUTED PAPERS

MAINTENANCE OF THE INTERNATIONAL CELESTIAL REFERENCE FRAME

E. F. Arias[1]

In the late XX century, the VLBI observations showed inconsistencies of several milliarcseconds (mas) in the models of celestial pole positions.

The International Astronomical Union (IAU) entrusted to a working group the design of a new model for a better fit of the observations of the celestial pole. Such work concluded with the publication of the precession-nutation model IAU2000, based on the transfer function by Mathews et al. (2002).

IAU Resolution B1.6 recommends that from Jan. 1st. 2003, the precession model IAU1976 and the nutation theory IAU1980, be replaced by the precession-nutation model IAU2000A when a precision level of 0.2 mas is required and by the IAU2000B model when the precision requirements do not exceed 1 mas.

[1] Bureau Internacional des Poids et Mesures, Paris, France.

THE GAIA ASTROMETRY MISSION

J. Torra[1]

GAIA, the ESA's astrometry, mission aims to determine positions, proper motions and parallaxes with 10 microarsecond precision at V=15. The satellite will also provide photometry and radial velocities. GAIA will observe a 1% of the stellar population of our galaxy, plus stars in nearby galaxies, as well as a large number of extrasolar planets and small bodies of the solar system. Its measures will have a large impact in most of the fields of astrophysics.

Data storage and treatment is one of the challenges of the mission. A complex data reduction system, GDAAS, -including among other aspects a detailed self-calibration process and a relativistic model for the astrometric astrometric observations-, has been designed in order to prove the feasibility of the GAIA mission.

In our presentation we will review the mission and its main goals as well as the approach to its data reduction.

[1] Universidad de Barcelona, Spain.

ASTROMETRY OF SOLAR SYSTEM OBJECTS USING THE DRIFT SCAN TECHNIQUE

I. Ferrín[1] and C. Leal[2]

We report the result of our search and astrometry of solar system objects carried out using the 1 m Schmidt telescope of the National Observatory of Venezuela. The telescope has attached a Mosaic CCD Camera of 67 Mega pixels in an array of 4x4 CCDs, each of 2048x2048 pixels, working in the drift scan technique. Of 501 observed asteroids, 11 were new. Of these 7 have Vaisäla orbits, and 4 were linked and are awaiting for a permanent designation. We had to perform astrometry of all objects and we present our residuals. As a product of this observational program, we discovered 372 new variable stars, observed several comets, TNOs and NEAS. The discovery of the plutino 38628 Huya was accomplished in the year 2000.

[1] Universidad de Los Andes, Mérida, Venezuela.
[2] Universidad de Oriente, Cumaná, Venezuela.

THEORETICAL ASPECTS OF DOUBLE AND MULTIPLE STAR FORMATION

M. F. Sterzik[1]

After a short review of classical theories of binary star formation (capture, fission, fragmentation), I will discuss modern concepts of binary and multiple star formation. Direct fragmentation during the isothermal phase of the protostellar cloud collapse, fragmentation of turbulent cloud cores and rotationally driven disk fragmentation are able to explain most parts of the observed binary star separation distributions. Dynamical processes in forming multiple stellar systems are explained, and their relevance to multiple star observations is highlighted.

[1] European Southern Observatory, Vitacura.

OBSERVATIONAL ASPECTS OF BINARIES

C. Melo[1]

Since the pioneering work of Duquennoy & Mayor (1991) it has been known that most of the solar-mass stars in the solar neighborhood are rather in binary or multiple systems than isolated. In the last decade, different observational surveys aiming to measure the binary fraction among the low-mass young stars in the nearby star forming regions have shown that multiplicity is likely to be strongly linked to the process of star formation itself. In this presentation, I will review these results and described the observational techniques used in these surveys to find binary stars. Special attention will be given to the spectroscopic measurement of radial velocity and its link to the field of exoplanet research. The physical implications of the observational results described here to Stellar Formation phenomenon will be explored by Michael Sterzik in his review.

[1] European Southern Observatory, Vitacura.

METHODS FOR (DIRECT) DETECTION OF EXTRASOLAR PLANETS

M. Vannier[1]

More than 140 extrasolar planets have been detected in the past decade, thus opening a new branch in Astronomy. Almost all of the detections where inferred using indirect methods, principally by measuring the variations of radial velocity in the spectrum of the host star due to the orbiting planet. Direct observation will have an enormous scientific impact on a number of open issues, but is much more challenging because of the very high contrast ratio between the planet and its star, and their very short angular separation. We will review the various techniques and projects proposed for achieving the direct observation, spectroscopy, and possibly imaging, of extrasolar planets. They include, in particular, high-extinction coronography and/or adaptive optics on large monopupil apertures, interferometric nulling or color-differential phase and surveys of transit or gravitational lensing due to a planet.

[1] European Southern Observatory, Vitacura.

CCD CAMERAS AND MERIDIAN ASTROMETRY

J. L. Muiños[1]

The author would like to present a brief review on the following topics:
- Meridian Astrometry and a description of a classic meridian circle.
- Application of CCD cameras to meridian telescopes: driftscan observations.
- Meridian Telescopes with CCD cameras: Flagstaff, Carlsberg, Burdeos, Valinhos and San Fernando.
- CCD data reduction techniques of meridian observations
- Construction of catalogues: subcatalogue and partial overlapping methods.
- Final remarks and conclusions.

[1] Real Observatorio de la Armada, San Fernando, Spain.

OPTICAL INTERFEROMETRY FOR ASTRONOMY

M. Vannier[1]

Large-aperture, long-baseline interferometric facilities (VLTI, Keck Interferometer, etc.) are currently coming out of the age of technical development to enter an operational phase of high-angular resolution observation tools for a wide scientific community. In this presentation, the principles of stellar interferometry and latest instrumental developments are exposed. The scientific case and some major recent results from this technique are reviewed. Some emphasis is put on the potential observer's point of view: why and how to apply for observation time with large-baseline interferometers such as the VLTI.

[1] European Southern Observatory, Vitacura.

LIST OF ABSTRACTS