RRL 2022 CEP | RR Lyrae & Cepheid Stars Conference

We are pleased to announce that the IV edition of the RRL meetings *RR Lyrae/Cepheids 2022 - Large-scale surveys as bridges between spectroscopy and photometry* will take place in the island of La Palma (Spain) from 26 to 30 September, 2022. The conference, intended to be in-presence, will be hosted at the H10-Taburiente Playa, Los Cancajos.

The registration for the meeting has opened on March 8, 2022. Detailed information can be found at the web page

https://research.iac.es/congreso/RRLCep2022

Rationale

The purpose of the series is to bring together the specialists of stellar pulsations in the classical instability strip (i.e., variables like δ Scuti, SX Phe, RR Lyr, Cepheids, Long-Period and Mira variables). These pulsating stars are used both as distance indicators and as laboratories for the study of stellar interiors. Large photometric surveys such as OGLE and the VVV have strongly contributed to the massive detection of RR Lyr in different stellar systems. They improved the Period-Luminosity relations and enhanced the variety of the physical properties supplied by the classical Petersen diagrams of radial modes. The surveys by CoRoT, Kepler, TESS satellites made it possible to detect non-radial modes, unveiling an unexpected mode mixture. RR Lyr and Cepheids are thus entering the domain of *ensemble asteroseismology*, opened by δ Sct and LPV variables. Other more complex phenomena such as the *Blazhko effect* and cycle-to-cycle variations are challenging our knowledge of the stellar atmospheres. The all-sky survey made by *Gaia* puts all our variable stars at the right place in the Galaxy, largely improving their use as distance ladders. The *Gaia* DR3 will disclose the huge treasure of the photometric time series. Not only this, the *Vera Rubin Observatory* will be a further large-scale photometric facility for the study of pulsating variables.

All these aspects will be revisited in the light of recent observational data. However, the new purpose of the La Palma meeting is to discuss how spectroscopy contributes to the study of pulsating variables. Spectroscopic surveys (APOGEE, S^5 , RAVE, ...) produced homogeneous sets of catalogues and databases very helpful to define the environments where our variables are located. On the other hand, high-resolution spectroscopy is essential to investigate the projection factor to solve the H_0 tension, to check the differences between the behaviours of photosphere and chromosphere induced by pulsations, to discover low-metallicity stars, and to certify cycle-to-cycle variations.

The *Observatorio del Roque de Los Muchachos* (ORM) hosts the *Telescopio Nazionale Galileo* (TNG), equipped with the HARPS-N and GIANO-B instruments, well suited to perform high-resolution spectroscopy. The WEAVE multifiber spectrograph mounted at the *William Herschel Telescope* (WHT), also at the ORM, is ready to contribute to large-scale surveys. Not only the TNG and the WHT, but the whole battery of the ORM telescopes (Gran Telescopio Canarias, Nordic Optical Telescope, Mercator, ...) are suitable to study pulsating variables.

With these premises we propose to meet again in La Palma to consolidate the scientific interest of stellar pulsations and to be prepared to exploit the large-scale surveys, both photometric and spectroscopic.

SOC

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K. Kinemuchi (Apache Point Observatory and New Mexico State University);

A. Kunder (Saint Martin's University);

N. Matsunaga (University of Tokyo);

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E. Poretti (INAF-TNG, co-chair);

V. Ripepi (INAF-OA Capodimonte);

R. Smolec (Nicolaus Copernicus Astronomical Center);

R. Szabó (Konkoly Observatory);

K. Visas (NOIRlab)

LOC

G. Andreuzzi (INAF-TNG, co-Chair)
L. Di Fabrizio (INAF-TNG, co-Chair);
C. Gallart (IAC);
N. Hernández Cáceres (INAF-TNG);
M. Martin Rodríguez (TNG);
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M. Sánchez Benavente (IAC);
J.J. San Juan Gómez (INAF-TNG)

TOPICS

* Spectroscopic Surveys
* Gaia DR3
* Photometric surveys
* Distance scale/H0 tension
* The Milky Way (structure, streams, halo, bulge, disc)
* Local Group galaxies
* Future instrumentation, projects, data analysis techniques
* Theory and pulsation models, Stellar evolution models
* Rotation, Atmospheric dynamics, binarity
* Blazhko, Petersen diagram

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