

First Announcement
IAU Symposium 376
Budapest, Hungary, 25 – 29 April 2022

At the cross-roads of astrophysics and cosmology:

Period–luminosity relations in the 2020s

IAU Symposium 376, 25 – 29 April 2022

Venue: Danubius Hotel Helia **** Budapest, Hungary

<https://www.danubiushotels.com/en/our-hotels-budapest/danubius-hotel-helia>

and a related International Spring School 20–23 April 2022

Modern methods of cosmic distance determination

Venue: Konkoly Observatory, Budapest, Hungary

Scientific rationale:

The period–luminosity relation (PLR) is an important relationship between the fundamental physical properties of a diverse range of variable stars. Most recognizable is the PLR of Cepheids, which renders classical Cepheids primary distance indicators, thus establishing the traditional cosmic distance scale. In addition, tight and well-defined relationships also exist between the periods and luminosities of other pulsating stars, including RR Lyrae-type variables, Type II and anomalous Cepheids, δ Scuti-type pulsators, and Mira variables. Curiously, not only pulsating stars exhibit PLRs: well-defined, long-established relationships between (orbital) periods and luminosities also exist for contact binaries of W Ursae Majoris (EW) type. At this Symposium we will discuss recent results—both observational and theoretical—achieved by the continued scrutiny of the detailed characteristics of the PLR, including its shape, calibration, and dependence on stellar parameters and chemical abundances; intrinsic PLR widths may offer unique insights into the physical processes shaping these relations and the underlying physical properties of the stars contributing to these relationships (stellar structure, atmospheric parameters, pulsation properties). This topic is very timely, given the wealth of empirical data recently obtained using state-of-the-art ground and space-based facilities, high-impact Gaia data releases, the impending operations of the James Webb Space Telescope, and — on slightly longer timescales — the next-generation ground- and space-based observatories (E-ELT, TMT, GMT, LSST, PLATO).

Key Topics of the conference:

- Stellar variability
- Pulsation physics
- Stellar structure and atmospheric dynamics
- Cosmic distance scale
- Hubble parameter
- Gaia, JWST, ground-based time-domain surveys: Vera Rubin Observatory, VISTA, PanSTARRS, OGLE, etc.

Scientific Organizing Committee:

Richard de Grijs (chair)	Macquarie University	Australia
László L. Kiss (chair)	CSFK/Konkoly Observatory	Hungary
Rachael Beaton	Princeton University	USA
Márcio Catelan	PUC Santiago	Chile
Xiaodian Chen	NAOC Beijing	China
Gisella Clementini	INAF OAS Bologna	Italy
Wolfgang Gieren	U. de Concepción	Chile
Stella Kafka	AAVSO	USA
Noriyuki Matsunaga	University of Tokyo	Japan
Victoria Scowcroft	University of Bath	UK
Róbert Szabó	CSFK/Konkoly Observatory	Hungary
Andrzej Udalski	University of Warsaw	Poland
Patricia Whitelock	SAAO/Univ. Cape Town	South Africa

The week before the conference (20-23 April 2022) we organize **an International Spring School** for PhD students, postdocs and early career scientists with prominent lecturers and hands-on sessions on the following (and related topics):

- Distance determination methods near and far
- Gaia revolution in distance measurements
- PL relations of pulsating stars
- Hubble constant and Hubble tension
- Current view of the structure of our Galaxy using field stars, open clusters
- Exotic new methods of distance determination (gravitational lensing, baryon acoustic oscillations, gamma-ray bursts as distance tracers)
- Working with the Gaia catalog
- Machine learning and its applications

We invite everyone to join us and discuss recent developments in the field.

Kind regards,

Richard de Grijs
László L. Kiss
SOC chairs

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