A. Summary of Highlights

The period–luminosity relation (PLR) is an important relationship between the fundamental physical properties of a diverse range of variable stars. Most recognisable 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 Ursa Majoris (EW) type.

The ultimate goal of IAU Symposium 376 was to 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 initial operations of the *James Webb Space Telescope* (*JWST*) and—on slightly longer timescales—the next-generation ground- and space-based observatories.

We framed the conference by initially focusing on the discrepancy in the Hubble constant based on different approaches, including the "standard" Cepheid PLR. It is clear that the *JWST* will soon become a game changer given the amazing data already generated by the new observatory. Even at this early time, we are seeing significant improvements in spatial resolution with respect to that offered by the *Hubble Space Telescope* at similar (near-)infrared wavelengths. In fact, preliminary results imply that the scatter in the Cepheid PLR at 1.5 μm may be reduced by a factor of 2–3.

Another eye-catching aspect brought up in many inspirational talks is the phenomenal distance accuracy currently achievable from Cepheid PLRs. *Gaia* cluster Cepheids now show LMC-like scatter in their Wesenheit relations, while the distance to M33 has now been established to better than 1.3%. This finally allows us to understand secondary effects, such as the impact of period fluctuations (e.g., in M51) on distance estimates.

Among the classical Cepheids, renewed interest is focused on multimode variability and period fluctuations, from short-period overtones to ultralong-period variability. Current developments promise exciting opportunities to much better determine the stellar mass–luminosity relation. Perhaps even more importantly, we are now reaching observational regimes where we can finally get a good handle on metallicity effects. It has become clear that the importance of *Gaia* for studies of variable stars cannot be overstated. At the present time, we already have access to *Gaia* observations of 271,000 RR Lyrae stars among some 10 million variables in Data Release 3 (DR3), with DR4 potentially reaching up to 100 million variable stars.

In view of all of these exciting developments, the future of this field looks extremely promising. Increasing data volumes are fundamentally changing our approaches, as we have already seen in the *Gaia* context, and this will only be accelerated when facilities such as the Vera Rubin Observatory and its Legacy Survey of Space and Time come online. Spectroscopic time-series observations clearly are the future of this field. Beyond the optical and near-infrared domains, X-ray variability, ultraviolet data and radio approaches are increasingly hitting the forefront of the field, so we are warned to keep an eye out for new developments in those areas and an open mind as regards one's favourite wavelength range.

In addition to the Symposium's formal scientific programme, a public lecture by Nobel laureate Adam Riess (Johns Hopkins University, USA)—*The Surprising Expansion History of the Universe*—was held on 19 April 2023 at the Hungarian Academy of Sciences. It was attended by some 300 audience members, and the YouTube recording (https://www.youtube.com/watch?v=d7ch-15M2QU&ab_channel=MTA1825) has thus far accumulated more than 2300 views.

B. Executive Summary

Rationale:
In the early 1900s, Henrietta Leavitt (1908)—and later Adams and Joy (1927) and Shapley and Walton (1927)—showed that bright Cepheid variables were characterised by a narrow range in spectral type or, equivalently, temperature at a given period. This, in turn, led to the establishment of a tight period–luminosity relation (PLR): more luminous stars are expected to have longer pulsation periods. The spectral-type/temperature restriction of Cepheids naturally led to the realisation that pulsating variables only occur in a narrow "instability strip" in the Hertzsprung–Russell diagram.

Stellar physics: The instability strip is host to a range of periodic variable stars, including classical Cepheids (δ Cephei stars), Mira variables at the top of the asymptotic giant branch (AGB), W Virginis stars (intermediate-mass horizontal-branch stars; "Population II" Cepheids), and RR Lyrae stars. SX Phoenicis and δ Scuti variables (jointly known as dwarf Cepheids or ultrashort-period variables) as well as anomalous Cepheids, and ZZ Ceti, V777 Herculis and GW Virginis pulsating white dwarfs are also found in the instability strip. All of these stellar types obey specific period–density relations. Curiously, not only pulsating stars exhibit PLRs: well-defined and long-established relationships between orbital periods and luminosities also exist for contact binaries of W Ursa Majoris (EW) type. Crucial remaining open issues in this broad field include the metallicity dependence of the zero point of the Cepheid PLR, the possible presence of a break at a pulsation period around 10 days, and the effects of binarity and circumstellar envelopes. Intrinsic PLR widths may offer unique insights into the physical processes shaping these relations and the underlying physical properties of the contributing stars (stellar structure, atmospheric parameters and pulsation properties).

Distance tracers: A promising approach to reducing the current systematic uncertainties associated with the present-day expansion rate of the Universe—the well-known tension in the Hubble parameter—is by trying to achieve improved local calibrations of primary distance indicators and their derivatives, including calibration of the photometric zero point of the Cepheid PLR, at both optical and—potentially with much reduced scatter—infrared wavelengths (e.g., starting from existing *Spitzer* data), for instance through trigonometric-parallax measurements of carefully selected Cepheid samples by *Gaia*. Improvements in the Cepheid and Mira distance scales will be achievable to a level of 3–4% or better, based on forthcoming mid-infrared observations with the James Webb Space Telescope (*JWST*). Perhaps the most powerful use of the variety of PLRs present for variable stars is the ability to cross-check results from any individual technique. The diverse range of stellar types exhibiting PLRs are drawn from distinct stellar populations, with their own age and metallicity distributions. Working together, these techniques can explore population-based systematics in distance determination to provide insights into potential calibration biases in the current Type Ia supernovae calibration.

Major progress facilitated by the conference:
After much discussion, we decided to frame the conference by initially focusing on the discrepancy in the Hubble constant based on different approaches, including the "standard" Cepheid PLR. This choice led to many productive and engaging discussions, triggered by numerous inspiring talks that highlighted the latest developments. In essence, this theme followed on from the Spring school on the distance ladder that had been organised at Konkoly Observatory during the week prior to the conference week.

From the outset, it became clear that the *JWST* will soon become a game changer given the amazing data already generated by the new observatory. Thanks to its flawless launch and smooth initial operations, the community is now looking at an observatory that may last much longer than its nominal 5-year operational lifetime. In turn, this offers an enormously expanded scope for studies of distance ladder. Even at this early time, we are seeing significant improvements in spatial resolution with respect to that offered by the *Hubble Space Telescope* at similar (near-)infrared wavelengths. In fact, preliminary results imply that the scatter in the Cepheid PLR at 1.5 μm may be reduced by a factor of 2–3. Multiple speakers presented very exciting results based on early *JWST* data.

Another eye-catching aspect brought up in many inspirational talks is the phenomenal distance accuracy currently achievable from Cepheid PLRs. *Gaia* cluster Cepheids now show LMC-like scatter in their

Wesenheit relations, while the distance to M33 has now been established to better than 1.3%. This finally allows us to understand secondary effects, such as the impact of period fluctuations (e.g., in M51) on distance estimates.

Similarly, tip of the red giant branch (TRGB) distance determination has come a really long way over the past three or more decades and promises to deliver a powerful alternative approach to the standard PLR technique for Cepheids, pushing to ever greater distances. In addition, newly developed stellar population methods now allow us to apply the "J-AGB" method, exploiting the variability properties of carbon-rich stars.

Meanwhile, comparisons of distance estimates using different, independent methods are finally coming together. By pursuing minimisation of systematics and secondary variability effects, over the past decade the distance ladder has narrowed from a consideration of many complementary, independent techniques to a streamlined ladder with well-defined rungs, from Geometry to Cepheids, from Cepheids to SNe Ia, and from SNe Ia to redshifts. However, the field is now returning to the broader implications resulting from this much-improved ladder, with a greater focus on cross-checks with other methods. *Gaia*, *JWST* and soon the Vera Rubin Observatory/Legacy Survey of Space and Time will be game changers out to nearby galaxies at distances of tens of Mpc.

Despite an early focus on the challenges posed by the extragalactic distance scale, a significant fraction of the conference was dedicated to the underlying physics governing stellar pulsation and variability, for different types of tracers. Among the classical Cepheids, renewed interest is focused on multimode variability and period fluctuations, from short-period overtones to ultralong-period variability. Current developments promise exciting opportunities to much better determine the stellar mass–luminosity relation, often based on pain-staking, detailed work where every object counts. Perhaps even more importantly, we are now reaching observational regimes where we can finally get a good handle on metallicity effects in the context of Cepheid variability.

AGB stars are coming back into fashion, particularly because of improved calibration methods and new theoretical developments. Parallaxes from masers obtained with very long baseline interferometry (VLBI), at nearby distances anchored by *Gaia* parallaxes, are providing very useful constraints. These are important developments in the era of the new extremely large telescopes which are more infrared-sensitive than their smaller counterparts. Moreover, the Square Kilometre Array, the ngVLA, the Event Horizon Telescope and other major radio initiatives open up new areas of research involving AGB and semi-regular variables as useful tracers of the physics of and distances to numerous nearby galaxies.

RR Lyrae stars remain the workhorse PLR tracers for older stellar populations given their pre-eminent importance for near-field cosmology and for understanding the formation history of our own Galaxy, particularly when combined with dynamical data. *Gaia* has also triggered a revival in this field, complemented by many cutting-edge ground-based projects. A major focus at the present time is on the metallicity dependence of the RR Lyrae PLRs, so that their empirical basis now supports theoretical arguments. The wealth of data available at the present time and their high quality now allow us to consider secondary effects that may play a role in this field, such as the light-curve shape, multi-mode pulsation properties, period changes, binarity, circumstellar envelopes, etc.

Stellar pulsation physics has clearly reached a high level of maturity, so that our attention is increasingly focused on more diverse pulsator types other than classical Cepheids and RR Lyrae, including anomalous and Type II Cepheids, δ Scuti stars, magnetically and chemically peculiar stars, scaling relations and PLRs pertaining to supergiant pulsators, contact binary systems and many others.

It has become clear that the importance of *Gaia* for studies of variable stars cannot be overstated. It has already collected more than a trillion CCD measurements down to G~21 mag with uncertainties as good as 1 mmag. At the same time, the mission provides colours and spectroscopic time-series observations (for future release), thus making it the perfect tool for variability studies. At the present time, we already have access to *Gaia* observations of 271,000 RR Lyrae stars among some 10 million variables in Data Release 3 (DR3), with DR4 potentially reaching up to 100 million variable stars.

The key outstanding issue in this field, pertaining to PLRs in general, are the systematics affecting the current crop of *Gaia* parallaxes. We still need better ways to mitigate those effects, particularly as regards those objects that exhibit astrophysical confusion in the sense of outflows, disks, etc. At present, it appears that 'counter-corrections' are often similar to the recommended corrections, so that more work is required to overcome those limitations. Many methods were proposed (cluster membership, asteroseismology, binary systems with interferometric orbits, Mira stars with VLBI parallaxes, etc.), so it appears that the field is slowly moving to an acceptable solution in this area as well. The picture that is emerging is that there is not a single 'best' parallax correction that may or may not be magnitude-dependent, but we will have to resolve this issue using a sample-based approach.

Numerous contributions discussed the structure of the Milky Way, showing the significant synergies among different variability tracers, although different ages may trace different spatial components. Combined with dynamical measures, we now have a pretty good handle on the orbits of the Magellanic Clouds and their wake, on the warped and flaring young disk structure of the Milky Way, and even on the structure of our Galaxy on the other side of the Galactic Centre.

Theoretical advances are, of course, equally important as all those beautiful observational results. At this time, it seems that we are overwhelmed with high-quality data sets and theory is taking a bit of a back seat. Nevertheless, numerous teams are working on improving our theoretical understanding of the underlying pulsation physics, offering ever more detailed tests of models pertaining to the unmatched quality of observational data, including such models that focus on the boundaries of the classical instability strip. Major advances are seen in the context of understanding and modeling the effects of rotation and convection, where we are slowly moving from 1D to more realistic 3D models.

In view of all of these exciting developments, the future of this field looks extremely promising. Increasing data volumes are fundamentally changing our approaches, as we have already seen in the *Gaia* context, and this will only be accelerated when facilities such as the Vera Rubin Observatory and its Legacy Survey of Space and Time come online. Likewise, the Roman Space Telescope/*WFIRST* will also contribute to more and larger data sets, while smaller, ground-based facilities will still be required to provide reference data, follow-up opportunities and complementary temporal sampling.

Beyond photometry and light-curve analyses, spectroscopy represents the next frontier, and also here the future looks bright. Leading on from APOGEE and GALAH, the field is looking forward to exploiting such facilities as 4MOST, WEAVE, DESI, SDSS-V, etc., allowing us to start sampling the variable sky spectroscopically. In particular, radial velocity variability will be tackled with facilities like VELOCE (Cepheids) and, increasingly, *Gaia* (everything else?). It would be very helpful for the field as a whole to share analysis codes and improve accessibility to such tools so as to benefit a greater cross-section of the community.

Spectroscopic time-series observations clearly are the future of this field. Beyond the optical and near-infrared domains, X-ray variability, ultraviolet data and radio approaches are increasingly hitting the forefront of the field, so we are warned to keep an eye out for new developments in those areas and an open mind as regards one's favourite wavelength range (even including gravitational waves?). Standardisation and cross-calibration remain a concern, but major efforts are undertaken to get this under control. We are eagerly looking forward to the era of the extremely large telescopes. And will artificial intelligence start to play an important role in our improved understanding? By the time that these developments have matured, a follow-up IAU Symposium is probably warranted.

IAU Symposium 376 Programme, 1 April 2023

Sunday 16 April 2023
19:00–21:00 Welcome cocktail Hotel Danubius Helia – conference venue

Monday 17 April 2023			
09:00–12:20 Chair: Róbert Szabó			
09:00–09:30		*Opening ceremony*	Addresses by the SOC and LOC
09:30–10:00	R	Wendy Freedman (remote)	The Extragalactic Cepheid Distance Scale
Session I: Setting the Scene – The Extragalactic 'Problem'			
10:00–10:30	R	Adam Riess	Local Value of the Hubble Constant from SH0ES
10:30–11:00		*Coffee/tea break*	
11:00–11:30	I	Rachael Beaton	H0 at its Foundation: The Limitations of Anchors of the Distance Scale
11:30–11:50	C	Louise Breuval	The Cepheid Distance Scale and its Metallicity Dependence
11:50–12:20	I	Myung Gyoon Lee	The Tip of the Red Giant Branch as a Cosmological Probe
12:20–13:30		*Lunch*	
13:30–15:30 Chair: Richard de Grijs			
13:30–13:50	C	Gergely Dálya	Tackling the Hubble Tension with Gravitational Waves
13:50–14:10	C	Richard I. Anderson	A 1% Calibration of Long-period Variable Stars for the Extragalactic Distance Scale
14:10–14:30	C	Pierre Kervella	Inspecting the Ladder: the Cepheid Distance to the SN Ia Host Galaxy NGC 5584
14:30–15:00	R	Igor Soszyński	Period–Luminosity Relations in the Local Group of Galaxies
15:00–15:30	P	*Poster sparkler pitches (for schedule, see page 6)*	
15:30–16:00		*Coffee/tea break*	
16:00–18:00 Chair: László Kiss			
Session II: Stellar Pulsation Physics			
16:00–16:20	C	Arief Ahmad	Self-excited Pulsations in Global 3D Simulations of Cool, Luminous and Evolved Stars
16:20–16:40	C	Giulia De Somma	New theoretical Period–Luminosity–Colour and Period–Wesenheit relations for Anomalous Cepheids
16:40–17:00	C	Richard de Grijs	New Double Mode Cepheids from the Zwicky Transient Facility Survey
17:00–17:20	C	Saniya Khan	Investigating *Gaia* (E)DR3 Parallax Systematics Using Asteroseismology of Cool Giant Stars Observed by *Kepler*, *K2*, and *TESS*
17:20–17:40	C	Gergely Hajdu	Circumstellar Matter Around RR Lyrae Variables
17:40–18:00	C	Ernst Paunzen (remote)	Pulsation of Chemically Peculiar Stars

Tuesday 18 April 2023			
09:00–10:30 Chair: Nancy Evans			
09:00–09:20	C	Mami Deka	A Study of Stellar Photosphere – Hydrogen Ionisation Front Interaction in δ Scuti Stars
09:20–09:40	C	Susmita Das	A Multiwavelength Analysis of BL Her Stars: Models versus Observations
09:40–10:00	C	Géza Csörnyei	How 'Accurate' is 'Precise'? The effect of Period Fluctuations on PL Relations
Session III: Primary period–luminosity relation calibrators in the Milky Way			
10:00–10:30	R	Gisella Clementini	Impact of the ESA *Gaia* mission on the primary Period – Luminosity Relation Calibrators in the Milky Way: Cepheids and RR Lyrae
10:30–11:00		*Coffee/tea break*	
11:00–12:30 Chair: Tatiana Muraveva			
11:00–11:30	R	Martin Groenewegen	Primary Period–Luminosity Relation Calibrators in the Milky Way: Cepheids and RR Lyrae – Physical basis, Calibration, and Applications
11:30–11:50	C	Bogumił Pilecki	Cepheids with Giant Companions – A New Abundant Source of Cepheid Astrophysics
11:50–12:10	C	Mauricio Cruz Reyes	A calibration of the Galactic Cepheid luminosity scale based on *Gaia* DR3 open cluster astrometry
12:10–12:30	C	Erasmo Trentin	Cepheid Metallicity in the Leavitt Law (C-MetaLL) Survey. The Metallicity Dependence of Cepheid Period–Luminosity Relations
12:30–13:40		*Lunch*	
13:40–15:30 Chair: Caroline Huang			
13:40–14:10	I	Tatiana Muraveva	RR Lyrae stars as distance indicators in the *Gaia* Era
14:10–14:30	C	Laurent Eyer	Exploring the Complexities of Determining Mean Luminosity in Variable Stars: The Impact of Biased Means in Weighted Procedures
14:30–14:50	C	Giuliana Fiorentino	RRLs to Trace Early Galaxy Formation
14:50–15:10	C	Bartłomiej Zgirski	Near-infrared Period–Luminosity Relations for Galactic RR Lyrae based on Photometry from OCA and *Gaia* DR3 Parallaxes
15:10–15:30	C	Ilaria Musella	The Cepheid Based Cosmic Distance Scale: New Constraints from Updated Synthetic Multi-filter Cepheid PL Relations
15:30–16:00		*Coffee/tea break*	
16:00–17:10 Chair: Martin Groenewegen			
16:00–16:30	I	Abdelmajid Benhida	Photometric and spectroscopic measurement campaign on the RR Lyr (RR Lyrae) and R Scuti (RV Tauri), at the Oukaimeden Observatory in Morocco
16:30–16:50	C	Weronika Narloch	Period–Luminosity Relations for Galactic Classical Cepheids in the Sloan bands
16:50–17:10	C	Vincenzo Ripepi	On the Origin of Galactic Anomalous Cepheids
17:10–18:00		*Panel discussion (Chair: László Kiss: New stellar observations and tools)*	

Wednesday 19 April 2023			
09:00–12:30 Chair: Gisella Clementini			
Session IV: Disentangling the structural components of the Milky Way			
09:00–09:30	R	Vasiliy Belokurov (remote)	Milky Wy components with RR Lyrae
09:30–10:00	I	Akiharu Nakagawa	Implication of the Period–Magnitude relation for massive AGB stars and its astronomical applications
10:00–10:30	I	Dorota Skowron	The Structure of the Milky Way from Period–Luminosity Relations
10:30–11:00		*Coffee/tea break*	
11:00–11:20	C	Fran Jiménez-Esteban	Variability properties of the *Gaia* DR3 catalogue of Galactic AGB stars
11:20–11:40	C	Yi Ren (remote)	Granulation in Red Supergiants: The Scaling Relations
11:40–12:20	P	*Poster sparkler pitches (for schedule, see page 7)*	
12:20–13:40		*Lunch*	
14:00–17:00		*Budapest sightseeing*	
18:30–20:30	R	Adam Riess	*Public talk at the Hungarian Academy of Sciences: The Surprising Expansion History of the Universe*

Thursday 20 April 2023			
09:00–10:40 Chair: Vincenzo Ripepi			
09:00–09:20	C	Matteo Monelli	Towards Homogeneous Distances in the Local Group
09:20–09:40	C	Teresa Sicignano	The Distance Scales of Anomalous and Type 2 Cepheids from Near Infrared Observations in the Magellanic Clouds
09:40–10:00	C	Mónica Taormina	Early-type Eclipsing Binaries as Distance Indicators
10:00–10:20	C	Alexandre Gallenne	Sub-percent Binary Star Masses and Distances from Interferometric Observations
10:20–10:40	C	Maria Tantalo	On the Use of the Mean *J*-band Magnitude of Carbon Stars as a Distance Indicator
10:40–11:10		*Coffee/tea break*	
11:10–12:20 Chair: Dorota Skowron			
11:10–11:40	I	Armando Arellano Ferro (remote)	RR Lyrae Light Curves and their Role in the Globular Cluster Metallicity and Distance Determination
11:40–12:00	C	Javier Minniti	Using Classical Cepheids to Study the Far Side of the Milky Way Disk
12:00–12:20	C	Antonio Garcia Hernandez	The PL Diagram for dSct: Back in Business as Distance Estimators
12:20–13:30		**Group photo** *Lunch*	
13:30–15:30 Chair: Biwei Jiang			
13:30–14:00	R	Marcella Marconi (remote)	Theoretical Stellar Pulsation Physics
Session V: Period–luminosity relations in the nearby universe			
14:00–14:30	I	Anupam Bhardwaj	Period–Luminosity–Metallicity relations for classical pulsators at near-infrared wavelengths
14:30–14:50	C	Zoi Spetisieri	First Direct Measurement of the Stellar Association Bias in the SN Host Galaxy M101
14:50–15:10	C	Kayla Owens	An Independent Analysis of the Multi-Wavelength Cepheid PL Relations in NGC 7250
15:10–15:30	C	Kerdaris Kurbah	A Multi-phase Study of Theoretical and Observed Light Curves of Classical Cepheids in the Magellanic Clouds
15:30–16:00		*Coffee/tea break*	
16:00–18:00 Chair: Rachael Beaton			
16:00–16:20	C	Vincent Hocdé	Metallicity estimations of MW, SMC, and LMC classical Cepheids from the shape of the *V*- and *I*-band light curves
16:20–16:40	C	Shu Wang	Double-mode RR Lyrae Stars – A Robust Distance and Metallicity Indicator
16:40–17:00	C	Felipe Espinoza-Arancibia	Empirical Constraints for the Instability Strip from the Analysis of LMC Cepheids
17:00–18:00		*Panel discussion – (Chair: Patricia Whitelock: The Role of Machine Learning and its Applications)*	

Friday 21 April 2023			
09:00–10:40 Chair: Patricia Whitelock			
Session VI: Non-traditional period–luminosity relations			
09:00–09:30	I	Biwei Jiang	The Period–Luminosity Relation of Red Supergiants
09:30–10:00	I	Michał Pawlak (remote)	Period–luminosity relations formed by contact and close binary systems
10:00–10:20	C	Patryk Iwanek (remote)	Comprehensive Analysis of Mira-type Stars Variability and the Structure of the Milky Way
10:20–10:40	C	Miora Andriantsaralaza	Distance Estimates for AGB Stars – *Gaia* DR3 Parallax and PL Relation
10:40–11:10		*Coffee break*	
11:10–12:40 Chair: Anupam Bhardwaj			
11:10–11:30	C	Clara Martinez-Vazquez	Breaking the Law: A Segmented Period - Luminosity Relation in delta Scuti Stars
11:30–12:00	I	Michele Trabucchi (remote)	Long-Period Variables as Distance and Age Indicators in the Era of *Gaia* and LSST
12:00–12:20	C	Caroline Huang	The Mira Distance to M101
12:20–12:40	C	Piotr Wielgórski	Near-infrared Period–Luminosity Relations for Type II and Anomalous Cepheids in the Solar Neighbourhood
12:40–14:00		*Lunch*	
14:00–15:30 Chair: Shu Wang			
14:00–14:30	I	Xiaodian Chen	Possible studies on variable stars based on *CSST*
14:30–14:50	C	Dieter Engels	OH/IR Stars and the Period–Luminosity–Relation of Mira Variables
14:50–15:10	C	Fangzhou Ren	An uncharted but valuable distance indicator: Period–luminosity relation of W Ursae Majoris-type contact binaries
15:10–15:30	C	Megan Lewis	Galactic Center Miras: Period–luminosity Relations and Circumstellar Effects
15:30–		*Summary and closing ceremony*	

Poster Session 1: Monday 17 April 2023, 15:00–15:30		
No.	**Presenting author**	**Poster title**
P01	Christine Clement	Helen Sawyer Hogg and the Globular Cluster Period–Luminosity Relation
P02	Zsófia Bora	Distance Measurements of Type Ia Supernovae from Light Curve Fitting
P03	Anton Afanasiev	Decreasing the scatter of SN Ia host Cepheid PL relations
P04	Chul Chung	Population Age Origin of the Host Mass Step in Type Ia Supernovae
P05	Seunghyun Park	Evidence for strong progenitor age bias in type Ia supernova distance scale: Lessons from Cepheids
P07	Steve Ardern	First Detection of CO Emission from Cepheid Variables: a Step to Reducing the H_0 Error Budget
P08, P09	John Baruch	- A proposal for the absorption of light by dark matter to explain the Hubble Tension - Is the Period–Luminosity Relation for Cepheids upset by a small threshold for the absorption of light by Dark Matter?
P10	Géza Csörnyei	Cepheids in M51: cross-checking the PLR distance with independent estimates
P11	Maria Tantalo	Variable stars in NGC 6822
P12	Mahtab Gholami	Variable Stars in an Irregular Dwarf Galaxy, IC10
P13	Hedieh Abdollahi	Detection of Long-Period Variable Stars in And IX to Study Star Formation History and Dust Production Rate
P15	Jesper Storm	The effect of metallicity on the PL relation from a Baade–Wesselink type analysis of a Cepheids in the Milky Way and the Magellanic Clouds
P16	Tahere Parto	The Star Formation History and Chemical Enrichment of Sagittarius Dwarf Irregular Galaxy Derived from Long-period Variable Stars
P18	Gustavo Medina Toledo	RR Lyrae Stars as Standard Candles and Tools to Disentangle the Milky Way's History
P19	Bastian Lengen	On the Consistency of the Cepheid and TRGB Distance Scales
P20	Zehao Zhang	Dependence of Pulsation Mode of Cepheids on Metallicity
P21	Henryka Netzel	Non-Radial Modes in Classical Pulsators — Perspectives for Asteroseismology
P22	Emese Plachy	Classifying Milky Way Cepheids with *TESS*
P23	Dóra Tarczay-Nehéz	Testing Ultra-low Amplitude Cepheid Candidates in the Galactic Disk by *TESS* and *Gaia*
P24	Gábor Kovács	Thousand faces of convection

Poster Session 2: Wednesday 19 April 2023, 12:00–12:30		
No.	**Presenting author**	**Poster title**
P26	József M. Benkő	How Accurate are those Periods?
P27	Giordano Viviani	VELOcities of Cepheids (VELOCE) DR1: An Unprecedented View of Cepheid RV Variability and Spectroscopic Binarity
P28	Young-Beom Jeon	Review of BOAO Short Period Variable Star Surveys to Calibrate Period–Luminosity Relations
P29	Giovanni Catanzaro	Metallicity determination from IGRINS spectra for a sample of Galactic Cepheids
P30	Nancy Evans	The Mass of the Cepheid S Mus
P31	Javier Minniti	Spectral Energy Distribution Fitting to Find and Characterize Cepheids in Binary Systems
P32	Garance Bras	Observational Calibration of the Projection Factor of RR Lyrae Stars Using the SPIPS Pulsation Modeling
P33	Manuel Sánchez-Benavente	Multiband Photometry and Spectroscopy of RR Lyrae Field Stars
P34	Vázsony Varga	Improving the *Gaia* RR Lyrae Photometric Metallicities
P35	Cecilia Mateu	Calibrating RR Lyrae Absolute Magnitudes as a Function of Period Shift to Correct Post-ZAHB Evolution Systematics
P36	Olivera Latković	WUMaCat — The Largest Catalog of Individually Studied W UMa Stars
P38	Eric Hintz	IR Spectroscopy of stars in various instability strips
P39	Adrienn Forró	Validation of the RR Lyrae Identifications in the PanSTARRS PS1 3π Survey with K2 and *Gaia*
P40	Csilla Kalup	Combined *Gaia* and K2 Studies of Globular Cluster Variables
P41	Ernst Paunzen	Catalogue of Variable Stars in Open Cluster Fields
P42	Monika I. Jurkovic	The Classification Intricacy of Different Types of Cepheid Variable Stars and the Case of RU Camelopardalis
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