

ASTRONOMICAL INSTITUTE  
SLOVAK ACADEMY OF SCIENCES

PROCEEDINGS OF THE CONFERENCE  
**UNIVERSE OF BINARIES,  
BINARIES IN THE UNIVERSE**  
September 7 – 11, 2019, Telč, Czech Republic

CONTRIBUTIONS  
OF THE ASTRONOMICAL OBSERVATORY  
SKALNATÉ PLESO

• VOLUME L •

Number 2



March 2020

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Astronomical Institute of the Slovak Academy of Sciences  
2020

ISSN: 1336–0337 (on-line version)

CODEN: CAOPF8

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Editorial Office: Astronomical Institute of the Slovak Academy of Sciences  
SK - 059 60 Tatranská Lomnica, The Slovak Republic

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# PROCEEDINGS OF THE CONFERENCE

Edited by:

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## UNIVERSE OF BINARIES, BINARIES IN THE UNIVERSE

September 7 – 11, 2019, Telč, Czech Republic

Dept. of Theoretical Physics and Astrophysics, Faculty of Science, Masaryk  
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## LIST OF PARTICIPANTS

Auer, Reinhold	Private Observatory, Chudčice, Czech Republic, auer.reinhold@gmail.com
Bahar, Engin	Dept. of Astronomy and Space Sciences, Faculty of Science, Ankara University, Turkey, enbahar@ankara.edu.tr
Bahýl, Vladimír	“Júlia” observatory, Zvolenská Slatina, Slovakia, basoft@zv.psg.sk
Borkovits, Tamás	Baja Astronomical Observatory of Szeged Univer- sity, Hungary, borko@electra.bajaobs.hu
Brož, Miroslav	Astronomical Institute, Charles University, Fac- ulty of Mathematics and Physics, Czech Republic, mira@sirrah.troja.mff.cuni.cz
Celedon, Lient	University of Concepcion, Chile, lceledonpichun@gmail.com
Conroy, Kyle	Villanova University, Villanova PA, United States, kyle.conroy@villanova.edu
Csizmadia, Szilárd	German Aerospace Center, Berlin, Germany, szilard.csizmadia@dlr.de
Dębski, Bartłomiej	Jagiellonian University, Poland, bartlomiej.debski@uj.edu.pl
Drózdź, Marek	Mt. Suhora Observatory, Poland, sfdrozdz@cyf-kr.edu.pl
Dsilva, Karan	KU Leuven, Belgium, karan.dsilva@kuleuven.be
El-Badry, Kareem	University of California, Berkeley, United States, kelbadry@berkeley.edu
Fedurco, Miroslav	Institute of Physics, Faculty of Science, Pavol Jozef Šafárik University in Košice, Slovakia, miroslav.fedurco@student.upjs.sk
Forró, Adrienn	Konkoly Thege Miklós Astronomical Institute, Re- search Centre for Astronomy and Earth Sciences, Hungarian Academy of Sciences, Hungary, adrienne.forro@gmail.com
Gajdoš, Pavol	Institute of Physics, Faculty of Science, Pavol Jozef Šafárik University in Košice, Slovakia, pavol.gajdos@student.upjs.sk
Gazeas, Kosmas	National and Kapodistrian University of Athens, Greece, kgaze@phys.uoa.gr
Griffin, Elizabeth	Dominion Astrophysical Observatory, Herzberg As- tronomy & Astrophysics Research Centre, NRC, Canada, Elizabeth.Griffin@nrc-cnrc.gc.ca

Güzel, Ozan	Ege University, Science Faculty, Astronomy and Space Sciences Department, Izmir, Turkey, Turkey, ozanguzel35@outlook.com
Hajdu, Tamás	Konkoly Observatory, Research Centre for Astronomy and Earth Sciences, Hungarian Academy of Sciences, Hungary, t.hajdu@astro.elte.hu
Harmanec, Petr	Astronomical Institute of Charles University, Faculty of Mathematics and Physics, Czech Republic, hec@sirrah.troja.mff.cuni.cz
Hartman, Zachary	Lowell Observatory & Georgia State University, United States, hartman@astro.gsu.edu
Hegedüs, Tibor	Baja Observatory of the University of Szeged, Hungary, hege@electra.bajaobs.hu
Choi, Philip	Department of Physics and Astronomy Pomona College, United States, pchoi@pomona.edu
Christopoulou, Eleftheria-Panagiota	Department of Physics, The Theoretical and Mathematical Physics, Astronomy and Astrophysics Division, University of Patras, Greece, pechris@physics.upatras.gr
Içli, Tuğçe	Department of Astronomy and Space Sciences, University of Ege, Turkey, icli.tugce@gmail.com
Janók, Jan	Department of Theoretical Physics and Astrophysics, Faculty of Science, Masaryk University, Brno, Czech Republic, honza@physics.muni.cz
Johnston, Cole	Institute of Astronomy, KU Leuven, Belgium, Belgium, colecampbell.johnston@kuleuven.be
Jonák, Juraj	Astronomical Institute, Charles University, Czech Republic, juraj.jonak@gmail.com
Kafka, Stella	AAVSO, United States, skafka@aavso.org
Kim, Yonggi	Department of astronomy and space science, Chungbuk National University, Republic of Korea, ykkim153@chungbuk.ac.kr
Kiran, Evrim	Department of Space Sciences and Technologies, Faculty of Science, Akdeniz University, Antalya, Turkey, kiran.evrin@gmail.com
Koçak, Dolunay	Department of Astronomy and Space Sciences, University of Ege, Turkey, dolunay.kocak@gmail.com
Kochoska, Angela	Villanova University, Villanova, United States, a.kochoska@gmail.com
Kolesnikov, Dmitry	SAI, Moscow State University, Russian Federation, kolesnikovkda@gmail.com

Kučáková, Hana	Institute of Physics, Faculty of Philosophy and Science, Silesian University in Opava, Czech Republic, hana.kucakova@fpf.slu.cz
Lalounta, Eleni	Department of Physics, University of Patras, Greece, elalounta@upatras.gr
Lee, Chung-Uk	Korea Astronomy and Space Science Institute, Republic of Korea, leecu@kasi.re.kr
Martin, David	University of Chicago, United States, davidmartin@uchicago.edu
Mason, Brian	U.S. Naval Observatory, NW Washington, United States, brian.d.mason@navy.mil
Merc, Jaroslav	Institute of Physics, Pavol Jozef Šafárik University in Košice, Slovakia / Astronomical Institute of Charles University, Prague, Czech Republic, jaroslav.merc@gmail.com
Mikulášek, Zdeněk	Department of Theoretical Physics and Astrophysics, Faculty of Science, Masaryk University, Brno, Czech Republic, mikulas@physics.muni.cz
Miller, Rehae	University of Florida, United States, rewilson@ufl.edu
Miroshnichenko, Anatoly	University of North Carolina at Greensboro, United States, a_mirosh@uncg.edu
Mitnyan, Tibor	Baja Astronomical Observatory of Szeged University, Hungary, mtibor@titan.physx.u-szeged.hu
Mkrtichian, David	National Astronomical Research Institute of Thailand, Thailand, davidmkrt@gmail.com
Moe, Maxwell	University of Arizona, United States, moem@email.arizona.edu
Murphy, Simon	Sydney Institute for Astronomy, University of Sydney, Australia, simon.murphy@sydney.edu.au
Nemeth, Peter	AVCR, Ondrejov Observatory & Astroserver.org, Czech Republic, peter.nemeth@astroserver.org
Nielsen, Kristoffer	Max Planck Institute for Astronomy, Germany, kbested@gmail.com
Nuspl, Janos	Konkoly Observatory, CSFK, Hungary, nuspl.janos@csfk.mta.hu
Oláh, Katalin	Konkoly Observatory, MTA CSFK CSI, Hungarian Academy of Sciences, Hungary, olahkatalin5@gmail.com
Oomen, Glenn-Michael	KU Leuven/Radboud University, Belgium, glennmichael.oomen@kuleuven.be

Oplištilová, Alžběta	Astronomical Institute, Charles University, Faculty of Mathematics and Physics, Czech Republic, <a href="mailto:betsimsim@seznam.cz">betsimsim@seznam.cz</a>
Orosz, Jerome	San Diego State University, United States, <a href="mailto:jorosz@sdsu.edu">jorosz@sdsu.edu</a>
Parimucha, Štefan	Institute of Physics, University of P.J. Šafárik in Košice Slovakia, Slovakia, <a href="mailto:stefan.parimucha@upjs.sk">stefan.parimucha@upjs.sk</a>
Paunzen, Ernst	Department of Theoretical Physics and Astrophysics, Faculty of Science, Masaryk University, Brno, Czech Republic, <a href="mailto:epaunzen@physics.muni.cz">epaunzen@physics.muni.cz</a>
Pavlik, Václav	Astronomical Institute, Charles University, Faculty of Mathematics and Physics, Czech Republic, <a href="mailto:pavlik@sirrah.troja.mff.cuni.cz">pavlik@sirrah.troja.mff.cuni.cz</a>
Pawlak, Michal	Institute of Theoretical Physics, Faculty of Mathematics and Physics, Charles University, Czech Republic, <a href="mailto:michal.pawlak@utf.mff.cuni.cz">michal.pawlak@utf.mff.cuni.cz</a>
Pieńkowski, Daniel	Nicolaus Copernicus Astronomical Center Polish Academy of Sciences, Poland, <a href="mailto:dapien@camk.edu.pl">dapien@camk.edu.pl</a>
Pourbaix, Dimitri	Institute of Astronomy and Astrophysics Université Libre de Bruxelles, Belgium, <a href="mailto:pourbaix@astro.ulb.ac.be">pourbaix@astro.ulb.ac.be</a>
Prato, Lisa	Lowell Observatory, United States, <a href="mailto:lprato@lowell.edu">lprato@lowell.edu</a>
Prša, Andrej	Villanova University, Villanova, United States, <a href="mailto:aprsa@villanova.edu">aprsa@villanova.edu</a>
Reggiani, Maddalena	Institute of Astronomy, KU Leuven, Belgium, <a href="mailto:maddalena.reggiani@kuleuven.be">maddalena.reggiani@kuleuven.be</a>
Renzo, Mathieu	Anton Pannekoek Institute, University of Amsterdam, Netherlands, <a href="mailto:m.renzo@uva.nl">m.renzo@uva.nl</a>
Rode-Paunzen, Monika	BASIS -Library Austrian Academy of Sciences Vienna, Austria, <a href="mailto:monika.rode-paunzen@oeaw.ac.at">monika.rode-paunzen@oeaw.ac.at</a>
Rosu, Sophie	FNRS PhD student Groupe d'Astrophysique des Hautes Energies (GAPHE) Space Science, Technologies and Astrophysics Research University of Liege, Belgium, Belgium, <a href="mailto:sophie.rosu@uliege.be">sophie.rosu@uliege.be</a>
Rukmini, Jagirdar	Osmania University, India, <a href="mailto:rukminiouastro@osmania.ac.in">rukminiouastro@osmania.ac.in</a>
Sekaran, Sanjay	Instituut voor Sterrenkunde (IvS), Katholieke Universiteit Leuven, Belgium, <a href="mailto:sanjay.sekaran@kuleuven.be">sanjay.sekaran@kuleuven.be</a>
Senavci, Hakan	Ankara University, Faculty of Science, Dept. of Astronomy and Space Sciences, Ankara, Turkey, <a href="mailto:volkan.senavci@gmail.com">volkan.senavci@gmail.com</a>

Siopis, Christos	Institut d'Astronomie et d'Astrophysique, Université Libre de Bruxelles, Belgium, Christos.Siopis@ulb.ac.be
Skarka, Marek	Department of Theoretical Physics and Astrophysics, Faculty of Science, Masaryk University, Brno, Czech Republic, marek.skarka@gmail.com
Stevens, Daniel	The Pennsylvania State University, Department of Astronomy & Astrophysics Center for Exoplanets and Habitable Worlds, United States, dstevens1106@gmail.com
Szász, Gabriel	Department of Theoretical Physics and Astrophysics, Faculty of Science, Masaryk University, Czech Republic, gszasz@physics.muni.cz
Štegnér, David	Department of Theoretical Physics and Astrophysics, Faculty of Science, Masaryk University, Brno, Czech Republic, renget@seznam.cz
Teyssier, Francois	Astronomical Ring for Access to Spectroscopy (ARAS), France, francoismathieu.teyssier@bbox.fr
Tokovinin, Andrey	Cerro Tololo Interamerican Observatory, Chile, atokovinin@ctio.noao.edu
Tout, Christopher	University of Cambridge, Institute of Astronomy, United Kingdom, cat@ast.cam.ac.uk
Triaud, Amaury	School of Physics & Astronomy, University of Birmingham, Edgbaston, Birmingham, United Kingdom, a.triaud@bham.ac.uk
Tvardovskyi, Dmytro	Odessa National I.I. Mechnikov University & Odessa National Maritime, Odessa, Ukraine; Université de Moncton, Moncton, New Brunswick, Canada, dmytro.tvardovskyi@gmail.com
Van Hamme, Walter	Department of Physics, Florida International University, United States, vanhamme@fiu.edu
Volkov, Igor	Institute of Astronomy of the RAS, Moscow, Russia Sternberg Sternberg Astronomical Institute of the MSU, Moscow, Russia, hwp@yandex.ru
Wilson, Robert	Astronomy Department University of Florida Gainesville, Florida, United States, rewilson@ufl.edu
Wolf, Marek	Astronomical Institute, Charles University, Faculty of Mathematics and Physics, Czech Republic, wolf@cesnet.cz
Zasche, Petr	Astronomical Institute, Charles University, Faculty of Mathematics and Physics, Czech Republic, petr.zasche@email.cz

Zejda, Miloslav	Department of Theoretical Physics and Astrophysics, Faculty of Science, Masaryk University, Brno, Czech Republic, zejda@physics.muni.cz
Zelinka, Ivan	Department of Computer Science, Faculty of Electrical Engineering and Computer Science VŠB-TUO, Ostrava-Poruba, Czech Republic, ivan.zelinka@vsb.cz
Zervas, Konstantinos	Dept of Physics, University of Patras, Greece, konst.zervas@upatras.gr
Zhou, Xiao	Yunnan Observatories (YNOs), Chinese Academy of Sciences (CAS); National Astronomical Research Institute of Thailand (NARIT), China, zhouxiao-phy@ynao.ac.cn
Zúniga-Fernández, Sebastián	Núcleo Milenio de Formación Planetaria (NPF), Valparaíso, Chile & European Southern Observatory, Santiago de Chile, Chile & Universidad de Valparaíso, Instituto de Física y Astronomía (IFA), Valparaíso, Chile, sebastian.zuniga@postgrado.uv.cl

## PREFACE

The recent discovery of planets in binary star systems has raised considerable interest in how such systems form and evolve. Satellites such as Kepler and TESS are providing observational data of unprecedented precision and time-wise coverage, uninterrupted by the diurnal cycle. They have opened new avenues for exploration and discovery. So we are grateful to our Czech colleagues for having organized a conference devoted to some of the latest developments in binary star research. Entitled “A Universe of Binaries – Binaries in the Universe,” the conference was held at the University Centre of Masaryk University from the 7th to the 11th of September, 2019. The picturesque town of Telč, nestled in the hills of the Czech Vysočina region, roughly halfway between Prague and Vienna, provided a perfect backdrop.

The meeting was structured around a broad range of topics, each anchored by one or more forty-minute invited oral presentations. One of the themes highlighted the important role citizen-astronomers are playing in binary and variable star astronomy and the indispensable organizations that facilitate such collaborations. Examples are the American Association for Variable Star Observers (AAVSO) in the U.S. (Kafka) and Chungbuk National University in Korea (Kim). There is a long history of amateur astronomers providing photometric data on variable stars and eclipse timings, but we now also see amateur spectroscopy making inroads into binary star astronomy as demonstrated by activities of the Astronomical Ring for Amateur Spectroscopy (ARAS) in France (Teyssier). Space missions like Kepler, Kepler2, and TESS, originally designed with the discovery of exoplanets in mind, have resulted in a treasure trove of binary data and more is to come from future missions like CHEOPS and PLATO (Csizmadia). The binary star community can anticipate a deluge of eclipsing binary data in Gaia Data Release 3 (Pourbaix). Detection of planets around binary stars has spawned research into the formation of binary systems and planets (Moe) and planetary systems in binaries (Triaud, Orosz, Martin). Many binary systems are members of hierarchical multiples, creating interesting interactions (Tokovinin, Brož). Pulsating stars in binaries (Murphy, Mkrtichian) and the presence of discs have inspired modeling program developers (Prsá, Wilson) to expand underlying physical models. Massive binary star evolution (Renzo), binaries with composite spectra (Griffin), and cataclysmic variables (Sion) all added fascinating topics for discussion.

I thank the invited speakers (names above in parentheses) for framing the conference, and all other participants who were given the opportunity to present oral or poster contributions. Manuscripts were reviewed and edited by members of the Scientific Organizing Committee. All manuscripts submitted before the deadline are printed in this volume.

I am pleased to acknowledge all who have contributed to the success of the conference. First I thank the sponsoring institutions: Masaryk University in Brno, Charles University in Prague, the Astronomical Institute of the Academy



of Sciences of the Czech Republic in Ondřejov, and the Astronomical Institute of the Slovak Academy of Sciences at Tatranská Lomnica, Slovakia. I am grateful to my fellow SOC members for valuable suggestions on invited speakers, assistance with putting together the scientific program and help with managing the manuscript review process. SOC members included Tamasz Borkovits (Hungary), Kyle Conroy (USA), Ed Guinan (USA), Stella Kafka (USA), Chung-Uk Lee (Korea), David Mkrtychian (Thailand), Theo Pribulla (Slovakia), John Southworth (UK), Andrei Tokovinin (Chile), Silvia Toonen (The Netherlands), Guillermo Torres (USA), Chris Tout (UK), and Bob Wilson (USA). It was a privilege to serve as SOC chair. Special thanks go to the Local Organizing Committee (Jan Janík, Richard Komžík, Ernst Paunzen, Marek Skarka, Pavel Suchan, Gabriel Szász, Petr Zásche) and the tireless LOC chair, Miloslav Zejda, for conceiving the conference and managing all of its logistical aspects. And not least, we thank all participants for making this conference memorable and scientifically rewarding. Participation by so many young researchers and graduate students bodes well for the future of the field.

Walter Van Hamme, SOC Chair

Miami, January 2020