



Dr H. Tuğça Şener

Education

- 2010-2015 **PhD.**, *Armagh Observatory / Queen's University Belfast, U.K.*
2006-2010 **MSc.**, *Astronomy and Space Sciences - Erciyes University, Turkey, GPA:3.5/4.0.*
2001-2006 **BSc.**, *Astronomy and Space Sciences - Ankara University, Turkey, GPA:73.7%.*

Work Experience

- 2019 - 2020 **Assistant Professor**, *Mt. Suhora Observatory & Pedagogical University of Krakow, Poland.*
This position is primarily for a researcher who can pursuit her own researches. My main research field is hot subdwarf stars in binaries and their optical observations. I also teach astronomy courses for the Pedagogical University students.
- June 2015 - Sept. 2017 **Post-doctoral researcher**, *Korea Astronomy and Space Science Inst., Rep. of Korea.*
This position was primarily for a researcher who can pursuit her own researches using the SDSS4 data. My main project was searching for subdwarf + late-type dwarf (late-M dwarfs and brown dwarfs) systems within APOGEE data. I also participated activities supporting the operation of CfLAT within 30% of my time. My studies were mainly focused on HW Vir type systems and their optical observations.

Ph.D. Thesis

- Title ***The Extraordinary Outcomes of Common-Envelope Evolution***
- Supervisors Prof. Dr. C. S. Jeffery & Dr. Gavin Ramsay
- Description The aim of my project is to examine binary systems containing at least one unusual hot subdwarf. These systems allow us to explore possible outcomes of common-envelope (CE) ejection in a close binary. Depending on the observational results (i.e. orbital period, mass ratio, chemical abundances, etc.) a conclusion for these exotic systems can be reached regarding an idea of the formation and evolution of He-rich subdwarf binaries, especially regarding the CE evolution. Besides a general perspective on their formation, they will also help us to go further on stellar evolution and confirm our current knowledge about outcomes of CE evolution. The first object studied was PG 1544+488, an exceptional short-period spectroscopic binary containing two helium-rich subdwarfs. I obtained and improved orbital and atmospheric parameters for each component. We concluded that in a CE binary containing two helium cores of nearly equal mass, the entire hydrogen envelopes of both stars are ejected. This places a very strong constraint on the physics of the CE ejection mechanism. The second object was BI Lyn and the first goal was to determine whether the relative motion of the two components could be resolved, and subsequently to obtain the dynamical mass ratio. Radial velocities of both components were measured but it was not possible to determine a period. An emission feature at $H\alpha$ is also observed, which varies within a single night's observation. The origin of this feature is discussed. Additionally, 17 subdwarf stars, are classified according to their helium abundances. For two of these; I obtained and improved orbital and atmospheric parameters for [CW83]1419-09 and recognised a variability of radial velocity for CD-31°4800. Exotic binaries like PG 1544+488 and BI Lyn place strong constraints on models for binary-star evolution. Further observations are required for BI Lyn, and to discover other exotic post-common-envelope binaries.

Masters Thesis

- Title ***Relation between the absolute parameters of W UMa stars and their X-ray properties***
- Supervisor Assoc. Prof. Dr. F. F. Özeren
- Description With this project I aimed to find the X-ray luminosities of the systems in the most recent Chromospheric Active Binaries Catalogue. The X-ray flux values are taken from ROSAT All-Sky Survey Faint and Bright Source Catalogues. A system is accepted as the source of the X-ray if the distance between the system and the X-ray source is $90''$ and below, considering the equatorial coordinates. The main purpose was to search if there is any relation between the X-ray luminosities and absolute parameters (e.g. T_{eff} , L_{bol} , $\log g$) of CABS. Although there was no apparent relationship between L_X and these parameters, I defined 330 systems as X-ray sources; updated X-ray luminosities of 214 systems and defined 116 sources for the first time.

Observation Experience

- May 2020 **1.5m - RTT150**, TUG, Antalya, Turkey.
1 night observation with MOS equipment of stars of an open cluster
- Nov 2019 **1.5m - RTT150**, TUG, Antalya, Turkey.
3 nights observation of chromospherically active metal-poor stars
- April 2016 **2.7m Harlan Smith Telescope**, McDONALD OBSERVATORY, Texas, USA.
4 nights observation of point sources
- 2011–2015 **43cm - Armagh Robotic Telescope**, ARMAGH OBSERVATORY, Armagh, U.K..
I have been one of the few students who is trained to use the Armagh Robotic Telescope.
 - Test observations & commissioning
 - Training work experience students
 - Casual observations
- March 2011 **1.9m - Radcliffe Telescope**, SAAO, South Africa.
10 nights observation of subdwarf systems
- April 2008 **1m - Cassegrain-Nasmyth-Telescope**, HOHER LIST OBSERVATORY, Germany.
Observations of some gravitational lensing systems for a term project
- Sept. 2005 **40cm - T40**, TUBITAK NATIONAL OBSERVATORY, Turkey.
Assistant observer at Strömgren observations of early type supergiant stars
- 2004–2007 **30cm - Maksutov Telescope with SSP5A Photometer**, ANKARA UNIVERSITY OBSERVATORY, Turkey.
Primary observer
 - Attended observations regularly once a week
 - Observed and analysed the light curves and minima times of binary systems
- 2004–2007 **15cm - Coude Telescope**, ANKARA UNIVERSITY OBSERVATORY, Turkey.
Sunspot observations

Teaching Experience

- 2019 - 2020 **Introduction to Astronomy**, Krakow Pedagogical University.
- 2004 - 2005 **Astronomy and Space Teacher for K12 students**, Bilim Koleji.

Computer Skills

- Advanced IDL, STARLINK, Visual Basic
- Intermediate Python, MAXIMDL, Binary Maker, MYSQL, PHP, HTML, L^AT_EX, Adobe Photoshop
- Basic FORTRAN 90, IRAF, SExtractor

Publications

- 2018 **Photometric Variability of the mCP Star CS Vir: Evolution of the Rotation Period**, Ozuyar, D., Sener, H.T., Stevens, I. R..
Publications of the Astronomical Society of Australia, Volume 35, id.e004 10 pp.

- 2014 **Spectroscopic Orbital Elements For The Helium-Rich Subdwarf Binary PG 1544+488**, Sener, H.T., Jeffery, C.S..
Monthly Notices of the Royal Astronomical Society, Volume 440, 2014, Issue 3, p.2676-2683
- 2013 **Spectroscopic Orbital Elements for Helium-Rich Subdwarf Binary PG 1544+488**, 6th Meeting on Hot Subdwarf Stars and Related Objects, Sener, H.T., Jeffery, C.S..
Astronomical Society of the Pacific, 2014., p.273
- 2013 **PG 1544+488: First Of Its Kind - A System Containing Helium-Rich Subdwarf Twins**, Setting a new standard in the analysis of binary stars, Leuven, Sener, H.T., Jeffery, C.S..
EAS Publications Series, Volume 64, 2013, pp.425-426
- 2005 **Photoelectric Minima of Some Eclipsing Binary Stars**, IBVS , No. 5649, Albayrak,B.; Yuce, K.; Selam, S.O.; Tanriverdi, T.; Okan, A.; Cinar, D.; Topal, S.; Ozgur, E.; Sener, H.T., Ergun,I.; Civelek, E..
- 2005 **Photoelectric Minima of Some Eclipsing Binary Stars**, IBVS , No. 5588, Aksu, O.; Ozavci, I.; Yuce, K.; Tanriverdi, T.; Senavci, H. V.; Yilmaz, M.; Kara, A.; Kaya, F.; Helvacı, M.; Cetintas, C.; Cinar, D.; Ozuyar, D.; Basturk, O.; Aydin, E.; Atlagan, O.; Sener, H. T.; Kabadayi, O.; Yelkenci, K.; Evin, B..
- 2004 **Amateur & Professional Researches at the Ankara University Observatory**, The 93rd Annual Meeting of the AAVSO.

International Meetings and Conferences

- March 2018 **The 8th International Workshop on Occultation and Eclipse**, Istanbul, Turkey.
- July 2016 **Binary Stars in Cambridge 2016**, Cambridge, United Kingdom.
Poster presentation: *Infrared spectra analysis of HW Vir*
- June 2016 **The 19th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun**, Uppsala, Sweden.
Poster presentation: *Infrared spectra analysis of HW Vir*
- Sept. 2015 **Resolving galaxies in the era of extremely large telescopes**, Monterey, USA.
- July 2015 **7th Meeting on Hot Subdwarf Stars and Related Objects**, Oxford, United Kingdom.
Poster presentation: *Searching for hot subdwarf + dwarf M/ brown dwarf binaries in APOGEE*
- Sept. 2014 **Binary Systems, Their Evolution and Environments**, UlaanBaatar, Mongolia.
Poster presentation: *PG 1544 + 488: a binary system containing helium rich subdwarf twins*
- Sept. 2013 **Setting a new standard in the analysis of binary stars**, Leuven University, Leuven, Belgium.
Poster presentation: *PG 1544 + 488: a binary system containing helium rich subdwarf twins*
- April 2013 **6th Meeting on Hot Subdwarf Stars and Related Objects**, Tuscon, USA.
Oral presentation: *Spectroscopic Orbital Elements for Helium-Rich Subdwarf Binary PG 1544+488*

- April 2012 **Third International Workshop on AM CVn stars**, Warwick University, Warwick, United Kingdom.
Poster presentation: *PG 1544+488: First of its type - A Binary system of He-rich subdwarf twins*
- March 2012 **UK - Germany National Astronomy Meeting NAM2012**, Manchester, United Kingdom.
Poster presentation: *PG 1544+488: First of its type - A Binary system of He-rich subdwarf twins*
- July 2011 **Physics of Stars Summer School at Advanced Research School in Physics**, Muğla, Turkey.
- Oct. 2010 **European Single Dish School in the Era of Arrays**, Max Planck Institute for Radio Astronomy, Bonn, Germany.
- Jan. 2010 **27th Winter School on Theoretical Physics Frontiers in High-Energy Astrophysics**, Jerusalem, Israel.
Poster presentation: *X-Ray properties of Abell2029*
- Oct. 2009 **International Workshop of Observational Cosmology**, Antalya, Turkey.
- Sept. 2009 **An Express Workshop On Alternative Solutions in Astrophysics-IV**, Çanakkale Onsekiz Mart University, Çanakkale, Turkey.
- Sept. 2009 **Astrophysics of Neutron Stars**, *ASTRONS*, Sabancı University, Istanbul, Turkey.
- July 2007 **Advanced Astrophysics Summer School**, Boğaziçi University, Istanbul, Turkey.
- July 2007 **An Express Workshop On Alternative Solutions in Astrophysics - II**, Çanakkale Onsekiz Mart University, Çanakkale, Turkey.
- July 2006 **An Express Workshop On Alternative Solutions in Astrophysics**, Çanakkale Onsekiz Mart University, Çanakkale, Turkey.
- July 2004 **High Energy Gamma-Ray Astronomy**, Heidelberg, Germany.

Popular Articles

- 2020 **Mr. Dean - Dekan Bey**, *BirGün, Daily Newspaper*, Turkey.
- 2020 **Only if you have a sign on your century - Asrını üstünde izin varsa benimse**, *BirGün, Daily Newspaper*, Turkey.
- 2019 **From the shadow of the planets to exoplanets - Gezegen gölgelerinden yeni gezegenlere**, *BirGün, Daily Newspaper*, Turkey.
- 2016 **World's Biggest Eye: Giant Magellan Telescope**, *TUBITAK (The Scientific and Technological Research Council of Türkiye) Science and Technology Magazine*, Turkey.
- 2015 **Space farming**, *TUBITAK (The Scientific and Technological Research Council of Türkiye) Science and Technology Magazine*, Turkey.
- 2012 **Milkomeda**, *TUBITAK (The Scientific and Technological Research Council of Türkiye) Science and Technology Magazine*, Turkey.
- 2011 **Public Volunteered Science Projects**, *NTV Science Magazine*, Turkey.
- 2009 **Space Sailing**, *TUBITAK (The Scientific and Technological Research Council of Türkiye) Science and Technology Magazine*, Turkey.

- 2007 **Too Much Work To Do On The Moon**, *TUBITAK (The Scientific and Technological Research Council of Turkiye) Science and Technology Magazine*, Turkey.
- 2005 **The Pistol Star**, *Popular Science Magazine*, Turkey.
- 2004 **Meteor Observations**, *Amateur Astronomy Magazine*, Turkey.

Public Outreach and Communication Skills

- 2020 - **AstroNotlar Podcasts and Website**, *I lead a team of 5 students, presenting a new episode along with a blog post about space or astronomy related topics, broadcasted weekly. Regular since the 1st of Jan 2020*, <http://astronotlar.space>.
- 2020 **AstroKahve Podcasts**, *Interviews with Turkish astronomers from all over the world*, <http://astrokahve.space>.
- 2019 **AstroKahve**, *Casual gatherings with astronomy enthusiasts of the town*, Ankara, İstanbul, Samsun, Antalya, Turkey.
- Nov. 2019 **Planetary Transits**, *Interactive talk with K12 students*, Kaş Kalkan Fen Lisesi - Antalya, Turkey.
- Nov. 2019 **Planetary Transits**, *Interactive talk with K12 students*, Bilfen - İstanbul, Turkey.
- Nov. 2019 **Mercury Transit**, *Public talk and observation*, Samsun, Turkey.
- Sept. 2019 **Antalya Science MeetUps**, *Life of an astronomer*, Antalya, Turkey.
- Aug. 2019 **Eyes of the Earth towards the space**, *Invited talk for astronomy school*, Mardin Gençlik ve Kültür Evi, Mardin. Turkey
- Aug. 2019 **22th National Astronomical Observation Festival**, *Organizer*, TÜBİTAK National Observatory, Antalya. Turkey
- July 2019 **Undergrads Student Summer Programme (LOYP)**, *Mentor*, TÜBİTAK National Observatory, Antalya. Turkey
- June 2019 **Scientist for a Day 2018-19 Contest Referee for Turkey**, *NASA Science, Solar System Exploration*.
- May 2019 - **Proofreader**, *Department of Academic Journals*, TÜBİTAK, Turkey. today
- April 2017 **Daejeon Star Festival**, *Organising committee member*, Daejeon, S. Korea.
- Sept. 2016 **20th Turkish National Astronomy Meeting**, *Organising committee member*, Erzurum, Turkey.
- Jan. 2014 **BBC Radio Ulster**, *Interview on radio programme Starry Starry Night*, Belfast, United Kingdom.
- Sept. 2012 **The 63rd International Astronautical Conference**, *World Space Week Association team member, Exhibition Boot*, Naples, Italy.
- Jan. 2012 **BBC Radio Ulster**, *Interview on radio programme Starry Starry Night*, Belfast, United Kingdom.

- Sept. 2011 **The 10th Annual Space Generation Congress**, *Organizing Team, Logistics Co-Coordinator*, Cape Town, South Africa.
- Aug. 2010 **Astrophysics of Neutron Stars**, *Organising committee member*, Izmir, Turkey.
- Aug. 2009 **12th National Astronomical Observation Festival**, *Advanced observer & instructor*, The Scientific and Technological Research Council of Turkiye.
- Sept. 2008 **7th International Micro-quasars Workshop**, *Organising committee member*, Izmir, Turkey.
- Aug. 2008 **11th National Astronomical Observation Festival**, *Advanced observer & instructor*, The Scientific and Technological Research Council of Turkiye.
- Aug. 2007 **10th National Astronomical Observation Festival**, *Advanced observer & instructor*, The Scientific and Technological Research Council of Turkiye.

Other Training Courses Attended

- 2016 **Sexual Harassment and Violence Prevention**, *Story of K Company*.
- 2015 **Data Protection and Freedom of Information Training**, *Information Commissioner's Office*.
- 2014 **WorldHost Customer Service Training Programme**, *Customer Sense Training and Consultancy*.
- 2013 **Health and Safety Awareness Training**, *EEF/Clarke Safety and Environmental Services*.
- 2013 **Time Management and Goal Setting**, *Queen's University of Belfast*.
- 2011 **Recruitment and Selection Training**, *EEF NI*.
- 2011 **Project Management in Real World**, *Fistral Training*.
- 2011 **Time Management**, *Queen's University of Belfast*.
- 2011 **Introduction to Project Management**, *Queen's University of Belfast*.
- 2003 **Process Management and Improvement Techniques**, *SMIDO ISO9001:2000*.
- 2003 **ISO9001:2000 Quality Systems Documentation**, *UNICON & SMIDO*.
- 2001 **Introduction to ISO9001:2000 Q. M. Systems.**, *Dolphins Co..*

Memberships and Positions

- 2019-Present **International Astronomical Union**, *Junior Member*.
- 2019-Present **European Astronomical Society**, *Member*.
- 2016-Present **American Association of Variable Star Observers**, *Observation Mentor*.
- 2010-Present **Royal Astronomical Society**, *Member*.
- 2010-2012 **Space Generation Advisory Council**, *National Point of Contact of Turkey*.
- 2006-Present **Turkish Astronomical Society**, *Member*.

Languages

Turkish **Native**

English **Fluent**

German **B2**

References

Andrea Boyd **Space Applications Services**, *ISS Flight Operations Engineer*, Germany.
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Dr. **Asia - Pasific Space Cooperation Organization**, *Deputy Director General of*
F.F.Özeren *Department Strategic Planning and Program Management*, China.
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Prof.Dr. **Ankara University**, *BSc. Supervisor, Emeretus Professor*, Turkey.
I.E. Derman ethem.derman@ankara.edu.tr