

Curriculum Vitae

Graziela R. Keller

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Nationality: dual - American and Brazilian.

1 Education

Year	Title	Institution
2011	Ph.D., Astronomy	Universidade de São Paulo (IAG/USP - Brazil)
2007	M.Sc., Astronomy	Universidade de São Paulo (IAG/USP - Brazil)
2004	B.Sc., Astronomy	Universidade Federal do Rio de Janeiro (Brazil)

2 Professional History

1. Current: Post-doctoral Fellow at IAG/USP:

Supervisor: Walter J. Maciel

I am involved in different projects:

- CSPNe spectroscopy. *Continuation of my Ph.D. research, using state-of-the-art grids of synthetic spectra calculated by us with the CMFGEN code in the analysis of far-UV, UV, and optical spectra of central stars of planetary nebulae (CSPNe). The derived stellar parameters for different classes of CSPNe will help clarify possible connections between different classes and their detailed evolutionary status. This project includes recently observed high resolution, high signal-to-noise ratio VLT/UVES spectra of CSPNe previously classified as weak emission line stars (ESO run 095.D-0256 - PI: Graziela R. Keller).*
- White Dwarfs (WDs) from matched catalogs - in collaboration with Luciana Bianchi (Johns Hopkins University). *Identification and characterization of hot WDs and hot WDs in binary systems, extracted from cross-matched SDSS and GALEX catalogs.*

HST spectroscopy of WDs. *A subsample of these objects has been observed by us with HST (spectroscopic snapshot program 13397 - PI: L. Bianchi). We obtained UV G140L+G230L (1150-3100 Å) spectroscopy of a benchmark sample of 14 hot white dwarfs, 11 of which in binary systems with a cooler companion. We are modeling the HST ultra-violet spectra in conjunction with SDSS spectra, through the use of Tlusty and MARCS model grids. The UV spectra constrain temperature and extinction concurrently and allow for the WD parameters to be derived accurately. In the binary systems, the analysis of UV and optical spectra enables derivation of parameters for both components, allowing a distance estimate for the pair and the accurate placement of the hot WDs on evolutionary tracks.*

HST photometry of WDs. *We selected a sample of hot WDs in binary systems with companions of spectral type from late B to early K, to be imaged in 5 WFC3 filters in the coming HST cycle 23 (snapshot program 14119 - PI: L. Bianchi). The pairs are unresolved in GALEX and SDSS imaging, but many are expected to be resolved with HST. We will measure separations, perform photometry and derive stellar parameters.*

Grants: FAPESP

- Visiting scientist at The Johns Hopkins University, Department of Physics and Astronomy, Baltimore - USA: January - April, 2013.
- Visiting scientist at The Johns Hopkins University, Department of Physics and Astronomy, Baltimore - USA: February - April, 2014.
- Visiting scientist at Institut für Astronomie und Astrophysik / Universität Tübingen, Tübingen - Germany: October - November, 2013.

2. Ph.D. - Astronomy - USP:

- Thesis Title: Hydrogen Deficient Central Stars of Planetary Nebulae: Synthetic Spectra and Spectral Analysis.

Advisor: Walter J. Maciel

The project consisted of building grids of CMFGEN synthetic spectra and using them on analysis of ultraviolet and far-ultraviolet spectra from H-poor central stars of planetary nebulae, in order to obtain well determined photospheric and wind parameters.

Grants: FAPESP and CAPES

- Visiting Ph.D. student at The Johns Hopkins University, Department of Physics and Astronomy, Baltimore - USA: June, 2009 - July, 2010. Advisor: Luciana Bianchi.
- Teaching assistant for the “Fundamentals of Astronomy” undergraduate course at IAG/USP - AGA0215

3. M.Sc. - Astronomy - USP:

- Dissertation Title: Alfvén Waves Applied to the Winds of Wolf-Rayet stars.

Advisor: Vera Jatenco Silva Pereira.

The Alfvén wave wind driving mechanism was included in 1D stationary magnetohydrodynamical simulations of the radiative winds of Wolf-Rayet stars.

Grants: FAPESP.

4. B.Sc. - Astronomy - UFRJ:

- Title of the Final Graduation Project: Study of the Chromospheric Activity in Solar Type Stars Through the H and K Ca II lines.

Advisor: Gustavo Frederico Porto de Mello.

This work aimed at the calibration of an age-chromospheric activity indicator for solar type stars through the analysis of the H and K Ca II lines.

Grants: FAPERJ.

- Title of Research Project: Detailed Re-Analysis of the Chemical Abundances of the α Centauri Binary System.

Advisor: Gustavo Frederico Porto de Mello.

In this work, we performed a new spectroscopic analysis of both components of the α Centauri system.

Grants: CNPq.

3 Observing Programs

1. PI of ESO VLT/UVES spectroscopic program (run 095.D-0256 - period 95): *The place of WELS in the context of central stars of planetary nebulae* - Observations completed.
2. Co-I of HST imaging snapshot program (14119 - cycle 23): *Understanding Stellar Evolution of Intermediate-Mass Stars from a New Sample of SiriusB-Like Binaries* (PI: L. Bianchi) - To be observed on cycle 23.
3. Co-I of HST spectroscopic snapshot program (13397 - cycle 21): *Understanding post-AGB Evolution: Snapshot UV spectroscopy of Hot White Dwarfs* (PI: L. Bianchi) - Observations Completed.

4 Skills

- IDL programming: daily use of IDL for data visualization and analysis, besides general processing and organization of large amounts of data.
- Other programming languages: I have also occasionally used, in my work, SQL and Fortran languages.

- Virtual Observatory Tools: TopCat, CDS X-Match Service, CasJobs, SkyView - Used mainly to cross-match catalogs and search and organize large amounts of data from different sources, particularly GALEX and SDSS catalogs, and obtain customized target charts from various SIAP servers.
- Experience with HST and ESO observation planning tools and phase II preparation.
- Other Tools: SExtractor, IRAF, FUSE, ESO/UVES, ESO/VIMOS data reduction pipelines.
- I have worked with spectra from HST (FOS, STIS, and HRS), IUE, and FUSE space telescopes, and from ground-based telescopes: SDSS (also BOSS), ESO's VLT (UVES and VIMOS), ESO's FEROS, and Coudé spectrograph at the 1.6m Pico dos Dias telescope in Brazil.

5 Peer-Reviewed Articles

1. Keller, Graziela R. ; Bianchi, Luciana ; Maciel, Walter J. UV spectral analysis of very hot H-deficient [WCE]-type central stars of planetary nebulae: NGC 2867, NGC 5189, NGC 6905, Pb 6, and Sand 3. *Monthly Notices of the Royal Astronomical Society*, v. 442, p. 1379, 2014.
2. Keller, Graziela R. ; Herald, James E. ; Bianchi, Luciana ; Maciel, Walter J. ; Bohlin, Ralph C. A new grid of synthetic spectra for the analysis of [WC]-type central stars of planetary nebulae. *Monthly Notices of the Royal Astronomical Society*, v. 418, p. 705, 2011.
3. Laganá, Tatiana F. ; de Souza, Rafael S. ; Keller, Graziela R. On the influence of non-thermal pressure on the mass determination of galaxy clusters. *Astronomy & Astrophysics*, v. 510, p. A76, 2010.
4. Keller, Graziela R. ; Jatenco-Pereira, Vera. Wolf-Rayet optically thick winds with Alfvén waves. *Advances in Space Research*, v. 46, p. 493, 2010.
5. Porto de Mello, Gustavo F. ; Lyra, Wladimir ; Keller, Graziela. R. The Alpha Centauri binary system. Atmospheric parameters and element abundances. *Astronomy & Astrophysics*, v. 488, p. 653, 2008.
6. Maciel, Walter J. ; Keller, Graziela R. ; Costa, Roberto D. D. Metallicity effects on the modified wind momentum of CSPNe. *Revista Mexicana de Astronomía y Astrofísica*, v. 44, p. 221, 2008.

6 Articles in Conference Proceedings

1. Keller, Graziela R. ; Bianchi, Luciana ; Herald, James E. ; Maciel, Walter J. Grids of Synthetic Spectra for H-poor Central Stars of Planetary Nebulae (CSPNe). In: *Planetary Nebulae: An Eye to the Future*, IAU Symp. 283, 2011, Tenerife. *IAU Symposium*, v. 283, p. 404-405, 2012.
2. Keller, Graziela R. ; Bianchi, Luciana ; Herald, James E. ; Maciel, Walter J. Using Grids of High Resolution Synthetic Spectra in the Analysis of [WCE] stars. In: *Circumstellar Dynamics at High Resolution*, 2012, Foz do Iguaçu. *Astronomical Society of the Pacific Conference Series*, v. 464, p. 309-316, 2012.

7 Recent Contributions to Conferences

1. Keller, Graziela R.; Bianchi, Luciana; Barstow, Martin A.; Bohlin, Ralph; Casewell, Sarah L.; Gaensicke, Boris T.; Bond, Howard E.; Long, Knox S. HST/STIS UV Spectroscopy of GALEX Selected Hot White Dwarfs. Hubble 2020: Building on 25 years of discovery, 2015, STScI, Baltimore - USA.
2. Bianchi, Luciana; Conti, Alberto; Shiao, Bernie; Keller, Graziela R.; Thilker, David A. The Ultraviolet Sky: final catalogs of unique UV sources from GALEX, and characterization of the UV-emitting sources across the sky, and of the Milky Way extinction. 223rd AAS Meeting, 2014, Washington, DC - USA.
3. Keller, Graziela R. ; Bianchi, Luciana ; Herald, James E. ; Maciel, Walter J. UV spectral analysis of very hot H-deficient [WCE] CSPNe: NGC 6905, Pb 6, NGC 5189, NGC 2867 and Sand 3. ESO/NUVA/IAG Workshop on Challenges in UV Astronomy, 2013, ESO, Garching - Germany.
4. Keller, Graziela R. ; Bianchi, Luciana ; Herald, James E. ; Maciel, Walter J. Using Grids of High Resolution Synthetic Spectra in the Analysis of [WCE] stars. ASPCS Circumstellar Dynamics at High Resolution, 2012, Foz do Iguacu - Brazil.
5. Keller, Graziela R. ; Bianchi, Luciana ; Maciel, Walter J. Grids of Synthetic Spectra for H-Deficient CSPNe. Workshop on Stellar Astrophysics at Observatório Nacional: Stellar Evolution and Stars in Transition Phases, 2012, Rio de Janeiro - Brazil.
6. Keller, Graziela R. ; Bianchi, Luciana ; Maciel, Walter J. Determining properties of evolved hot stars with winds from UV observations. UV Astronomy: HST and Beyond, 2012, Hawaii - USA.
7. Keller, Graziela R. ; Bianchi, Luciana ; Herald, James E. ; Maciel, Walter J. Grids of Synthetic Spectra for H-poor Central Stars of Planetary Nebulae (CSPNe). Planetary Nebulae: An Eye to the Future, IAU Symp. 283, 2011, Tenerife - Spain.

8 Selected Talks

1. Spectral analysis of very hot H-deficient [WCE]-type central stars of planetary nebulae. South African Astronomical Observatory (SAAO), Cape Town - South Africa. December 4th, 2014.
2. What do stellar spectra tell us? IAG/USP, São Paulo - Brazil. October 2nd, 2014.
3. Identifying hot WDs in binaries as an example of the use of catalog matching tools. IAG/USP, São Paulo - Brazil. May 14th, 2013.

9 Selected Schools and Courses Attended

1. 3D Spectroscopy Techniques (by J. Steiner) - 2012. IAG/USP, São Paulo - Brazil.
2. Bravo Virtual Observatory School (by M. Allen, M. Fitzpatrick, M. Graham, R. Hanisch, G. Iafrate, M. Ramella) - 2012. IAG/USP, São Paulo - Brazil.
3. Programming for Astronomy (by P. Penteado) - 2011. IAG/USP, São Paulo - Brazil.
4. The Analysis of Photoionized Media (by G. Stasińska) - 2010. UFSC, Florianópolis - Brazil.
5. Summer School: Introduction to Computational Fluid Dynamics - 2008. IME/USP - São Paulo - Brazil.
6. School on Astrophysical Fluid Dynamics - 2007. The Abdus Salam International Centre for Theoretical Physics. Trieste - Italy.

10 Current Grants

1. FAPESP Fellowship 2012/03479-2
2. I am a team member at thematic project FAPESP 2010/18835-3 - Planetary Nebulae, Stars and Chemical Evolution of Stellar Systems.

11 Other Information

- Member of the Sociedade Astronômica Brasileira (SAB);
- Further information, links to presentations, posters, papers, etc. available at <http://www.astro.iag.usp.br/~graziela/>;
- Grids of synthetic spectra available at <http://www.astro.iag.usp.br/~graziela/GRIDWEB/front.html>.