UPDATE ON UHE WHITE DWARFS

Nicole Reindl¹, Semih Filiz², John D. Landstreet^{3,4}, Stefano Bagnulo⁴, Jiri Krticka⁵, Klaus Werner², Veronika Schaffenroth¹, Stephan Geier¹, Ingrid Pelisoli⁶, S. O. Kepler⁷

¹ Institut für Physik und Astronomie, Universität Potsdam, Haus 28, Karl-Liebknecht-Str. 24/25, 14476, Potsdam-Golm, Germany

² Institute for Astronomy and Astrophysics, Kepler Center for Astro and Particle Physics, Eberhard Karls University, Sand 1, D-72076 Tübingen, Germany

³ Armagh Observatory and Planetarium, College Hill, Armagh BT61 9DG, UK

⁴ University of Western Ontario, London, Ontario, N6A3K7, Canada

⁵ Department of Theoretical Physics and Astrophysics, Masaryk University, Kotlářská 2, 611 37 Brno, Czech Republic

⁶ Department of Physics, University of Warwick, Coventry, CV4 7AL, UK⁷ Instituto de Física, Universidade Federal do Rio Grande do Sul, 91501-900 Porto-Alegre, RS, Brazil

What happens when a star transforms into a white dwarf? Admittedly, for about 10% of all stars in the universe we fail to answer this question, because – suddenly – these freshly born white dwarfs display weird absorption lines, which were tentatively identified as Rydberg transitions of ultra highly excitation (UHE) metal lines. This UHE phenomenon is known for almost three decades, yet no satisfying answer has been found. In this talk I will present recent progress on UHE white dwarfs that was made thanks to Gaia, photometric surveys like TESS or ZTF, dedicated spectroscopic and spectropolarimetric follow-up, and discuss open questions.