White dwarfs and gas discs: the good, the bad, and the weird

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1-2% of all white dwarfs exhibit IR excess flux, indicative of the presence of a planetary dusty debris disc. Among these already rare systems, roughly 4% also display double-peaked emission lines corresponding to various ionic transitions (most commonly the Ca II 850-866 nm triplet), the unmistakable signature of a flat gas disc in Keplerian orbit. These gas disc are the signpost of ongoing disruption events, collisions, or even the presence of a dense planetary body still surviving within the dust disc. Thus studying these systems provides the best opportunity to explore not only the physical properties of the debris discs, but also trace their dynamical evolution. Since the advent of Gaia, the number of known gas-disc systems tripled going from 7 to 21. This increased sample allowed us, for the first time, to study these objects as class and take a first peek at their global properties. However, with these discoveries a surprising degree of diversity is also starting to emerge challenging some of the long standing assumptions about these objects, and giving rise to new questions about the geometry, composition and evolution of these discs. I will give an overview of the diversity found among the known gas discs focusing on some recently identified peculiar characteristics, and I will describe the discovery of a new unique gas-disc system which displays some never-seen-before properties.