

# RATIONAL POINTS AND INTERSECTING LINES ON DEL PEZZO SURFACES

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Del Pezzo surfaces are classified by their degree  $d$ , which is an integer between 1 and 9 (for  $d \geq 3$ , these are the smooth surfaces of degree  $d$  in  $\mathbb{P}^d$ ). Over algebraically closed fields they are rational, and contain a fixed number of 'lines' (exceptional curves), depending on  $d$ . The set of rational points over non-algebraically closed fields is not fully understood, with more open questions as  $d$  goes down. A long-standing open problem is whether every del Pezzo surface of degree 1 has a dense set of rational points. Partial results are known, and often, the configuration of the lines on the surface plays a role in these results. In this talk I will show how the lines come in to play, and go over several computational results on the configuration of the 240 lines on a del Pezzo surface of degree 1. This is based on joint results, as well as work in progress, with Julie Desjardins, Yu Fu, Kelly Isham, and Ronald van Luijk.