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The combinatorics of arrangements of 2-planes in \mathbf{P}^4 can be described by a graph. We explore the geometry of those arrangements which can be described in this way by the Petersen graph. In particular, such arrangements are related—via liaison—to an intriguing family of surfaces. The exceptional geometry of these surfaces, in turn, reflects the combinatorial structure of the 2-plane arrangement. (Received August 30, 2005)