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Unexpected algebraic and geometric properties of Fermat-type configurations.

For a positive integer n, a Fermat arrangement of lines in $\mathbb{P}^2$ is given by linear factors of the polynomial

$$F_{2,n} = (x^n - y^n)(y^n - z^n)(z^n - x^n).$$

There is an associated configuration of points $Z_{2,n}$ determined by an almost complete intersection ideal

$$I_{2,n} = (x(y^n - z^n), y(z^n - x^n), z(x^n - y^n)).$$

These configurations provide interesting examples for the Containment Problem and in the area of unexpected hypersurfaces.

In my talk, based on a work in progress with Justyna Szpond, I will report on several interesting generalizations to higher dimensional spaces.