Osculating Circles, Evolute, 4-vertex theorem

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Osculating circles come up in geometry when you become interested in approximating plane curves in a better way than tangent lines do. The evolute is a curve obtained by taking all centers of curvature (centers of osculating circles). These are simple geometric objects that have some surprising and beutiful properties. I will talk about the Tait-Kneser theorem, the string construction and the 4-vertex theorem. If time allows generalizations to conics and cubics will also be discussed.