962-34-1368   **Abdul Salam M Jarrah*** (`ajarrah@nmsu.edu`), Department of Mathematical Sciences, New Mexico State University, Las Cruces, NM 88003. *The Center Variety of Polynomial Differentail Systems.*

A wide variety of natural phenomena are modeled by two-dimensional differential systems of the form $\frac{dx}{dt} = P(x, y)$, $\frac{dy}{dt} = Q(x, y)$ in which the variable t does not appear explicitly. If P and Q are continuously differentiable in some region of the xy-plane (phase space), then any solution $x = x(t)$, $y = y(t)$ of the above system describes a parametrized curve in the phase space, called a *trajectory*. A point (x_0, y_0) is called a *center* of the above system if it is surrounded by closed trajectories and $P(x_0, y_0) = Q(x_0, y_0) = 0$. Identifying the systems with a center at the origin is the so-called center problem, studied extensively since the early 20th century. For this talk, we are considering systems with P and Q polynomials of a special form. We present a general algorithm, using methods from computational algebra, to find all the systems of that form with a center at the origin whose trajectories have an axis of symmetry through the origin. Our algorithm works for any system of the above special form. (Received October 03, 2000)