I would be interested in giving a talk on "Traveling wave solutions of the porous medium equation." In the talk we would prove the existence of a one-parameter family of solutions of the porous medium equation in which the interface is a half line whose endpoint advances at constant speed. The interface is given by x = ct, y = 0, where c > 0 is the speed of the wave. We will look for solutions in the special form

$$u(x, y, t) = r(x, y, t)F(\theta(x, y, t))$$

where $r(x, y, t) = \sqrt{(x - ct)^2 + y^2}$ and $\tan(\theta(x, y, t)) = \frac{y}{x - ct}$. This results in an ordinary differential equation for F which we proceed to solve.