1135-35-1059 **Udita N Katugampola*** (dkatugampola@floridapoly.edu), Department of Mathematical Sciences, Florida Polytechnic University, Lakeland, FL 33809. *New fractional integral with applications to time-fractional Porous Medium Equation (fPME).* Preliminary report.

In this talk we study some properties of a generalized fractional integral which unifies six familiar fractional integrals into a unique form given by

$$\left({}^{\rho}\mathcal{I}^{\alpha,\beta}_{a+;\eta,\kappa}f\right)(x) = \frac{\rho^{1-\beta}x^{\kappa}}{\Gamma(\alpha)}\int_a^x \frac{\tau^{\rho\eta+\rho-1}}{(x^{\rho}-\tau^{\rho})^{1-\alpha}}f(\tau)\mathrm{d}\tau, \quad 0 \le a < x < b \le \infty.$$

We obtain a series representation of this integral along with asymptotic expansion and use them to solve a *time-fractional porous medium equation* in a subdiffusive case ($0 < \alpha < 1$) of the form

$$\begin{cases} \partial_t^{\alpha} u(x,t) = \left(D_0 u^m(x,t) u_x(x,t)\right)_x, \\ u(0,t) = C, \quad u(x,0) = 0 \end{cases}$$

where ∂_t^{α} is the Riemann-Liouville fractional derivative of order α. We show that *Erdélyi-Kober* type integral naturally appears in the model equation which then be replaced by the integral in question. We study several cases of m to illustrate the applicability of this approach. Also, we derive two new identities of Taylor-type which can be used in broader sense. (Received September 19, 2017)