

Seminar Title	: Study of some non-Newtonian flow and heat transfer problems
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Venue	: Seminar Room (Department of Mathematics)
Date and Time	: 18 Nov 2024 (5:00PM)
Abstract	: We analyze some steady and unsteady non-Newtonian laminar flow and heat transfer problems subject to diverse physical effects. The momentum equations give rise to system of highly nonlinear and fully coupled partial differential equations. Even after proper boundary layer approximations, it becomes difficult to solve the resulting system of nonlinear partial differential equations, analytically or numerically. We find suitable similarity variables by Lie group analysis. The obtained similarity variables reduce the partial differential equations into ordinary differential equations, which are solved numerically. The results are discussed with plausible physical interpretations. Interestingly, most of the problems under consideration possess multiple solutions. A temporal stability analysis has been used to find the feasible solutions.