1125-33-2873   **Charles T Fulton*** (`cfulton@fit.edu`), Dept of Mathematical Sciences, Florida Insitute of Technology, 150 W University Blvd., Melbourne, FL 32901, and **Heinz Langer**. *Special Functions arising from Sturm-Liouville Equations.* Preliminary report.

Typically special functions are studied with complex arguments. Here we take a different approach which formulates definitions of special functions associated with the Sturm-Liouville equation

$$-(p(x)y'(x))' + q(x)y(x) = \lambda r(x)y(x)$$

as functions of two variables, $y(x, \lambda)$, where x is real and λ is complex. For singular SL equations having endpoints of LC/N and LP/N type (N=nonoscillatory for all real λ), which are also RSPs, we formulate the definitions of Frobenius solutions, $i = 1, 2$, so that the following properties hold: (i) $y_i(x, \overline{\lambda}) = \overline{y_i(x, \lambda)}$ and (ii) $y_i(x, \lambda)$ entire in λ for fixed x. We then employ such special functions in the spectral analysis of Bessel, H-Atom and Associated Legendre equations. [See Fulton and Langer, Sturm-Liouville Operators with Singularities and Generalized Nevanlinna functions, Complex Anal and Oper Theory 4 (2010), 179-243; Fulton, Langer, Luger, The Associated Legendre Equation and Generalized Nevanlinna Functions; and Fulton, The Connection Problem for Solutions of Sturm-Liouville Problems with Two Singular Endpoints, and its Relation to m-Functions, Oberwolfach Report 1/2015 (DOI: 10.4171/OWR/2015/1).] (Received September 20, 2016)