

# QUANTUM INFORMATION VIA NON-ADDITIVE ENTROPY

**A. K. Rajagopal**

**Department of Computer Science, George Mason University, Fairfax,  
Virginia and Inspire Institute Inc., McLean, Virginia**

**ABSTRACT:** This lecture will address some issues of quantum information based on the framework of quantum non-additive entropy. This is a four-part presentation:

- (a) General introduction to the issues by discussing known many-body systems;
- (b) Exposition of basic concepts of quantum theory – uncertainty and superposition principles - in relation to quantum information illustrated in simple discrete systems (spins) leading to notions of separability and entanglement;
- (c) Quantification of quantum information base on the concepts of entropy illustrated with the simple systems discussed in (b) and exhibit implications of non-additive entropy in this connection; and finally
- (d) Concluding remarks will include topics not covered in this introductory presentation such as continuous systems (light), some open problems and issues as well as current ongoing attempts at practical implementation of these ideas.