

The 3+1 Formalism in the Geometric Trinity of Gravity

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Both a metric and a tetrad 3 + 1 formulation for a general affine connection is developed while also assuming nonmetricity. By splitting the space-time metric and tetrad into their spatial and temporal parts as well as through finding the Gauss-like equations for any tensor through which gravity is expressed, a general foundation for the formalisms is set up. Based on this foundation the resulting general 3-tetrad and 3-metric evolution equations are derived. Finally, through the choice of the two respective connections, the metric 3+1 formulation for General Relativity is reaffirmed and the tetrad 3+1 formulation of the Teleparallel Equivalent of General Relativity and the metric 3+1 formulation of Symmetric Teleparallel Gravity with the coincident gauge are derived up to the latest state of the research.

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