



**International Conference on Latest Trends in Engineering,  
Management, Humanities, Science & Technology (ICLTEMHST -2022)  
27<sup>th</sup> November, 2022, Guwahati, Assam, India.**

**CERTIFICATE NO : ICLTEMHST /2022/C1122967**

**IMPLICATION OF EXPONENTIAL SPACE AND THERMAL DEPENDENT  
HEAT SOURCE ON MHD BOUNDARY LAYER BIOCONVECTIVE CASSON  
NANOFLUID FLOW WITH GYROTACTIC MICROORGANISMS**

**AFSAR HOSSAIN SARKAR**

Research Scholar, Department of Mathematics,  
Dr. A.P.J. Abdul Kalam University, Indore, M.P.

**ABSTRACT**

A numerical and statistical analysis has been carried out to study the MHD boundary layer flow of bioconvective nanofluid with the presence of exponentially space dependent and thermal dependent heat source in the surface of the flow. The surface is permeable in nature. An externally transverse magnetic force field has been applied to the flow. In the boundary of the flow multiple slip conditions have been taken into consideration. In the flow there exist gyrotactic microorganisms along with nanoparticles with less than 1 % volume fraction. The flow model is constructed and then is solved numerically and analyse with statistical tools. We compare Casson flow model with Newtonian flow model. The main aim is to find the most suitable heat source factor to regulate the heat and mass transfer performance of the flow.

***Keywords: Bioconvection; Gyrotactic Microorganisms; Nanofluid; Exponential Space and Thermal Dependent Heat Source; Correlation Coefficients; Statistical Analysis.***