INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study	:	**Ph.D.**
Thesis Title	:	**Microfluid flow and particle transport in evaporating drops**
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SHORT ABSTRACT

In this thesis measurement and analysis of velocity and particle concentration profiles inside a sessile droplet subjected to various conditions of evaporation are reported. Investigations involve both experimental measurements using the technique of particle image velocimetry and computational fluid dynamics simulations. This work was aimed at providing deep insight into the internal fluid motion and particle deposition pattern inside an evaporating droplet containing dispersed particles. It was observed that the formation of patterns on substrate after complete evaporation depends on the evaporation conditions and physiochemical properties of the dispersed particles. The research discussed in this thesis highlights that the surface temperature distribution plays an important role in determining the internal fluid pattern and subsequently final deposition pattern. The contact line dynamics of the droplet also significantly affects the final deposition pattern of an evaporating droplet. This work also reveals that pattern formation of biological matter can be used for the identifying the nature of the fluids and nature of the dispersed particles in many biological applications. Furthermore, the results of this work could lead to control of the coffee ring effect in many microfluidic devices and future development of inexpensive disease diagnostic devices.