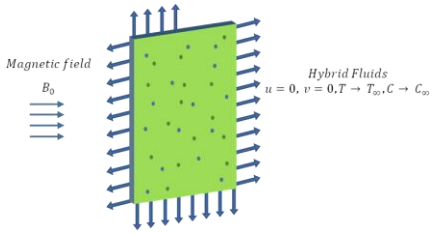
Studien- / Bachelor- oder Masterarbeit

Numerical Investigation in Heat and Mass Transfer via Nano and hybrid Nanofluids

Nanofluids are engineered suspensions of nanoparticles in base fluids that offer significant potential to improve thermal systems in automotive, energy, and electronics industries. By combining different nanoparticles into hybrid nanofluids, even more heat enhancements can be achieved. This thesis focuses on the numerical investigation of heat and mass transfer in nano and hybrid nanofluids under various conditions (e.g. slip effects, magnetic fields, buoyancy forces). Using mathematical modeling and advanced numerical techniques, students will explore how these fluids can optimize performance in applications like heat exchangers and radiators.

- Develop mathematical models (PDEs) for heat & mass transfer in nanofluids and hybrid nanofluids.
- Apply similarity transformations to derive ODEs from governing PDEs
- Solve using MATLAB (bvp4c) or Python solvers



Your benefits and learning outcomes	▪ Hands-on experience with applied mathematical modeling and simulation. ▪ Work on a cutting-edge research topic with industry relevance.
What should you bring with you?	▪ Fundamental knowledge in fluid mechanics & heat transfer ▪ Numerical methods (ODE/PDE) ▪ MATLAB or Python programming ▪ Interest in simulation & engineering applications
Begin	right away

Contact		
	Name	MSc. Muhammad Bilal Hafeez
	Office	E3.350
	E-Mail	Muhammad.bilal.hafeez@uni-paderborn.de