

# Multifunctional Composite Reinforced with Orientated Graphene

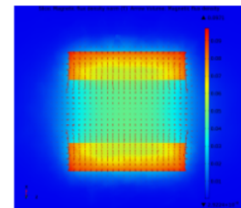
## Background

We are looking for someone to work with us on “**Graphene**”, a wonder material...!

Graphene is an allotrope of carbon consisting of a single layer of atoms arranged in a 2D-honeycomb lattice. It is the thinnest compound known to man, which is only one atom thick, but the strongest material with unmatched thermal, electrical and mechanical properties. We are specifically interested in developing a graphene based multifunctional composite. The idea is to study active orientation and dispersion control of 2D-nano structures in bulk polymers for optimization of multifunctional properties.

## Objective and Research Questions

- The aim of the project is to control graphene orientation using magnetic field
- To design and optimize Halbach array using numerical simulations to achieve uniform magnetic field
- Influence of graphene concentration in polymer matrix to achieve super-hydrophobicity

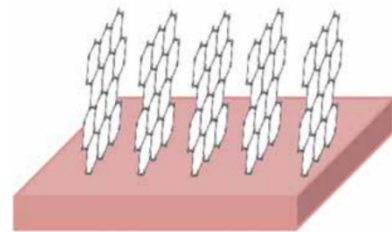


## Work Description

We are looking for a master's candidate who has an interest in manufacturing and characterization of nanocomposites. You should have taken relevant university courses like polymer physics, polymer processing, electro-magnetism and mechanics of composites.

*The student is expected to perform the following tasks-*

- Literature review
- Design and numerical simulations of the experimental setup
- Helping in manufacturing of nanocomposites and analysing results
- Preparing and writing scientific manuscripts/patent



## Qualification

You should have a background in mechanical, physics, chemistry, material science, or chemical engineering. You will work on the thesis towards obtaining a Master of Science degree at **Chalmers University of Technology** in collaboration with **2D-Tech**.

Supervisors: Dr. Viney Ghai ([ghai@chalmers.se](mailto:ghai@chalmers.se))

Ases Akas Mishra ([ases@chalmers.se](mailto:ases@chalmers.se))

Examiner: Prof. Roland Kádár ([roland.kadar@chalmers.se](mailto:roland.kadar@chalmers.se))

Starting date- October/November 2021 (Open to discuss)

***Please send your detailed resume (with skills and list of projects) to the supervisor if interested.***