Project title:

Using time-series forecasting to simulate 2D materials growth.

Using time-series forecasting to accelerate the simulation of 2D materials growth.

Project description:

2D materials, like graphene, are nanostructures limited to two directions and they have shown great potential in use in electronics. 2D materials are usually created through synthesis, exfoliation, or chemical vapor deposition. Understanding the growth process of 2D materials from experimental data is difficult, and there is a focus on using computational methods to further our understanding of the growth. A better understanding of the growth process will, for example, lead to more efficient growth techniques resulting in higher-quality 2D materials. This project will use time-series forecasting to speed up the simulations of the growth of 2D materials. Time-series forecasting, like auto-regressive integrated moving average (ARIMA), will be used to predict the forces involved in the simulations at future time steps thereby bypassing the expensive computation of some time steps, potentially leading to faster computations.

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Meetings:

The student, Birk Nøhr Dissing, will meet with the primary supervisor, Gemma C. Solomon, every 2 weeks for around 30 minutes. The student will decide the agenda of the meeting and prepare any relevant material in advance. The supervisor will read any material prepared, assuming the material is sent in a timely manner.

The student will also meet with William Bro Jørgensen for technical help with the project once every week or as needed.