Toward controlled ultra-high vacuum chemical vapor deposition processes

Dresscher, Martijn

Propositions

belonging to the dissertation

Toward Controlled Ultra-High Vacuum Chemical Vapor Deposition Processes

by

Martijn Dresscher

1. The modeling of fluxes in free molecular flow environments can provide us with the required insights to further improve quality of thin films produced in these environments [Ch. 2].

2. Integrating atomic absorption spectroscopy with ultra-high vacuum chemical vapor deposition processes allows for real-time observation of a selection of atomic partial pressures, which directly influence layer growth [Ch. 3].

3. Using atomic absorption spectroscopy measurements for controlling atomic partial pressures in a vacuum is feasible and quite straightforward when no depositions occur, but requires a thorough understanding of the dynamics otherwise [Ch. 4].

4. Considering a stochastic state allows us to explicitly consider the uncertainties that are always present in practice, but typically ignored for simplification purposes [Ch. 5].

5. Shaping the probability density function of the states is a nontrivial control problem that allows us to analyze and obtain desired convergence properties in the transient through a novel approach [Ch. 6].

6. Present challenges require humans to learn making personal decisions that consider the global ecosystem without relying on central coordination, this could be the next step in our cognitive evolution but we probably need to learn it the hard way.

7. We satisfy our addiction to economic growth by paying prices that cannot and are not evaluated economically. We probably would not have any economic growth if it would be and we are hence fooling ourselves.

8. Personal feedback through big data analysis is a powerful tool to re-prioritize our personal decision making for the benefit of the group. However, it also has the potential to destroy our autonomy, which is completely undesirable.