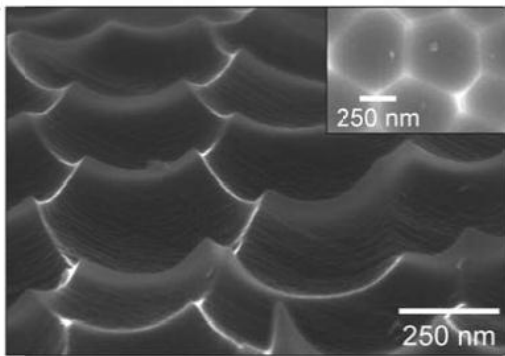


Solar cell substrates

Project:

Solar cells are likely to play an important role in tomorrow's energy supply. Many factors should be optimized to get efficient and cheap cells. An important part is played by the substrate, onto which the active silicon layer is deposited. In this project, we will investigate Aluminum foil as such a substrate. It is cheap, electrically conducting and highly reflective. Hence, light that is not reflected on a first pass through the Si will be reflected and get a second chance of being absorbed.



Now, if the reflection from the back side will be at an angle rather than straight back, the chance of absorption will be even greater. Therefore, we will try to produce nanostructures on the Al surface, similar to the ones shown in the pictures. We will produce these structures using anodization and coat them with Si. Subsequently, the absorption of light inside Si will be measured and modeled.

In addition, we will try to replicate the structures by pressing the heated Al “master” into a polymer film. The imprinted polymer can then be Al-coated and serve as a cheap, nanostructured solar cell substrate.

Contents:

Lab:

- Reflection measurement
- Anodization of Al foils.
- Deposition and characterization of Si films of Al foils.
- Imprint in polymers and Al-coating of polymers

Theory:

- Modeling of reflection from flat Al foils.
- Modeling of reflection from nanostructured Al foils.

Links:

- [Nanostructured Al foils.](#)

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