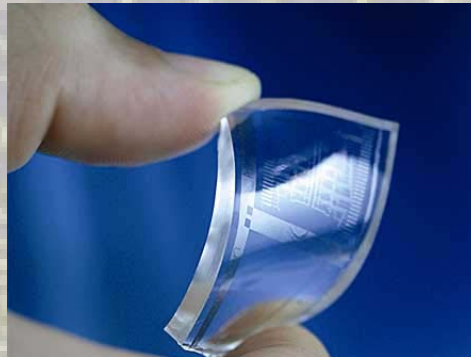


# **Grafeen**

**Het kristal van de toekomst**

# Van grafeen naar kristal

**C** (koolstofatoom)





**De kristalstructuur**

# Wat zijn kristallen?

## kristallen



## niet-kristallen



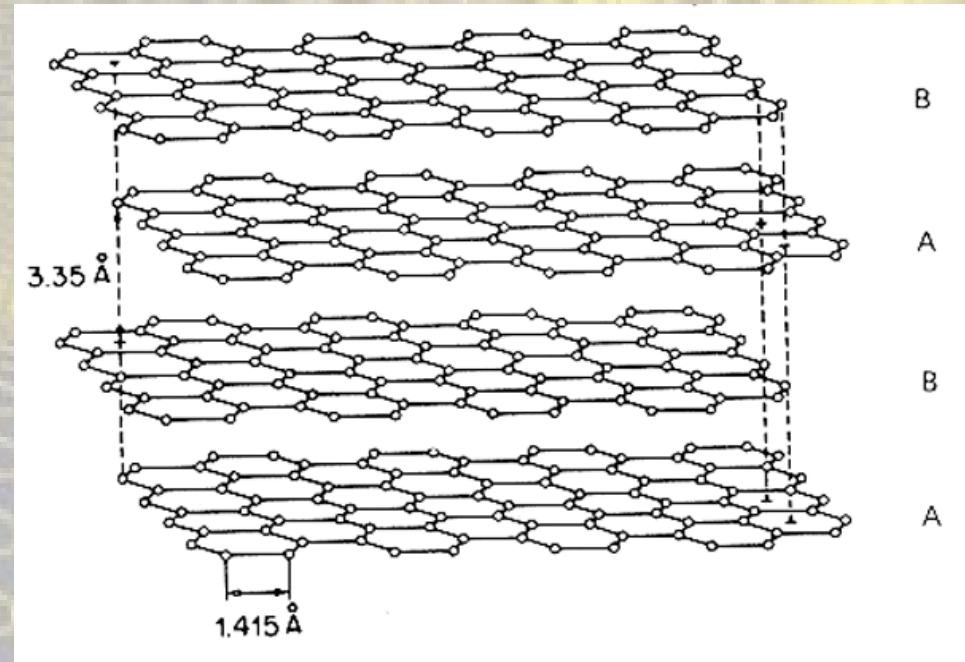
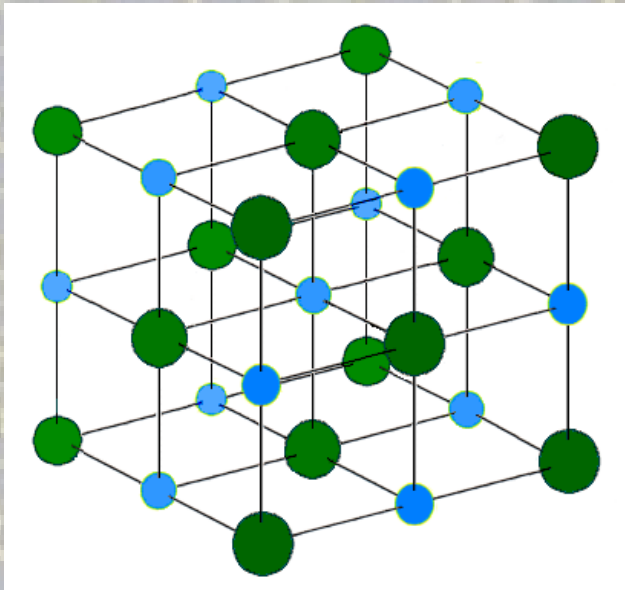


# Zelf gekweekte zoutkristallen



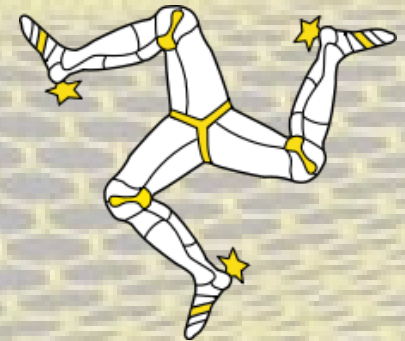
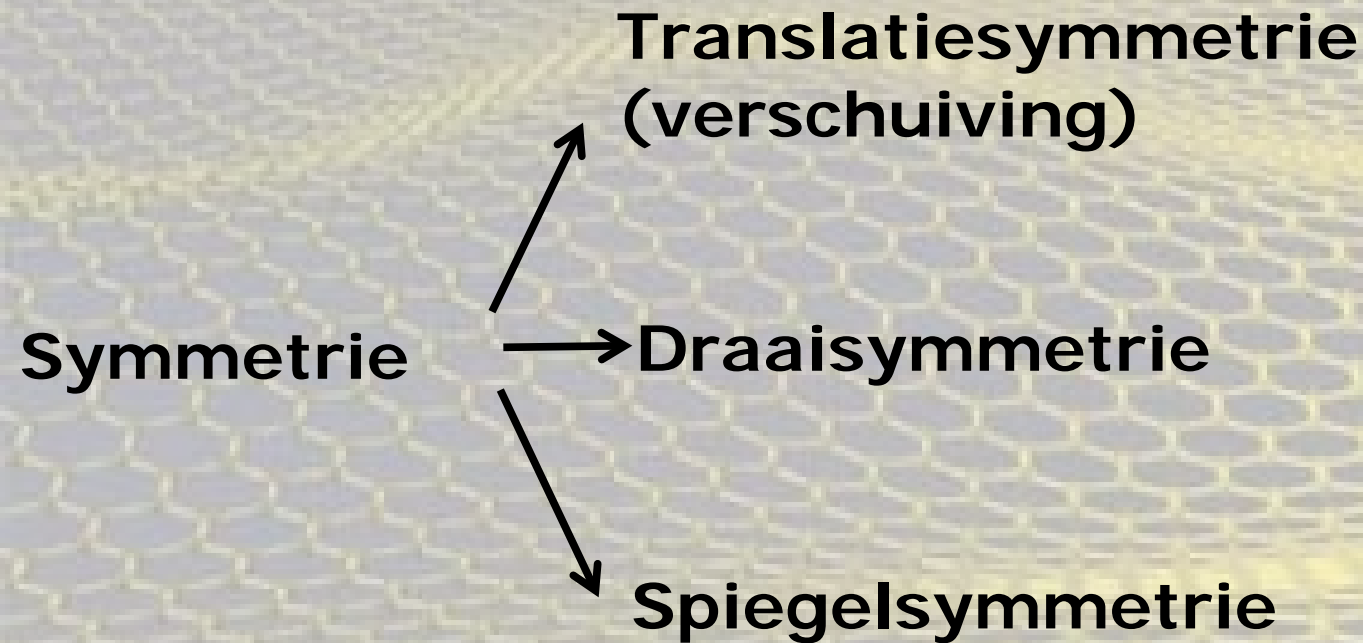
# Regelmaat

Beïnvloedt  
eigenschappen zoals  
hardheid en kleur.



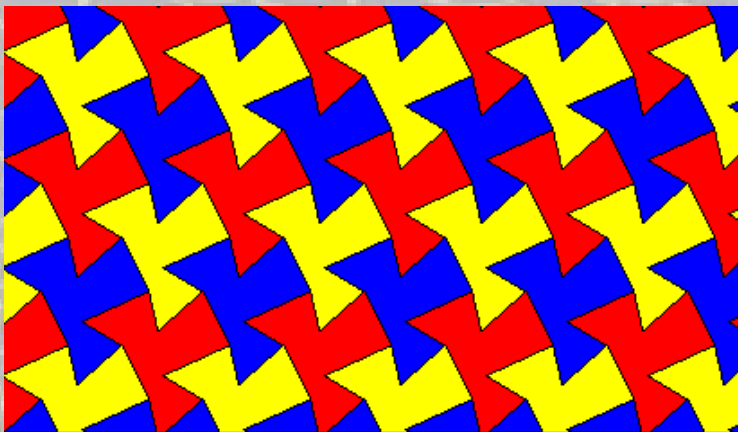
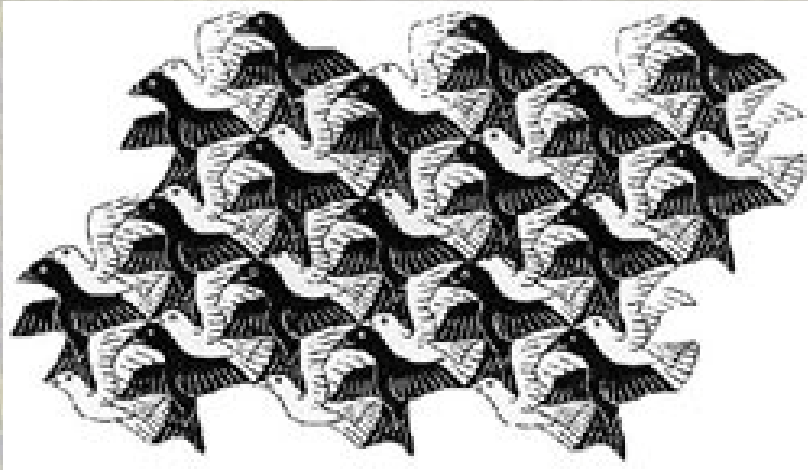
Regelmatige kristalstructuur  
bestuderen om eigenschappen  
te begrijpen.

# Regelmaat



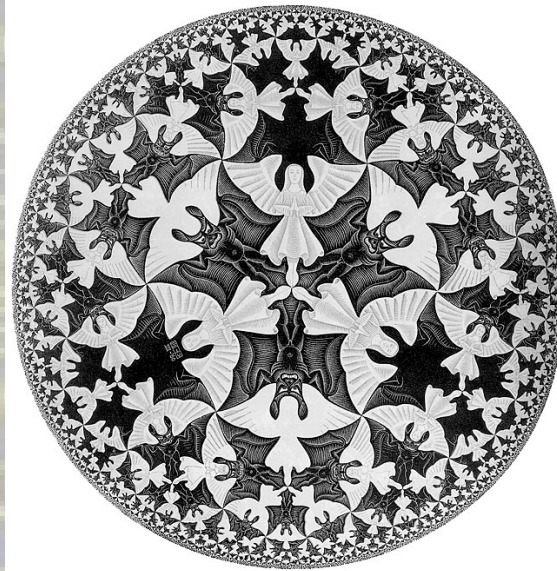


# Translatiesymmetrie (verschuiving)



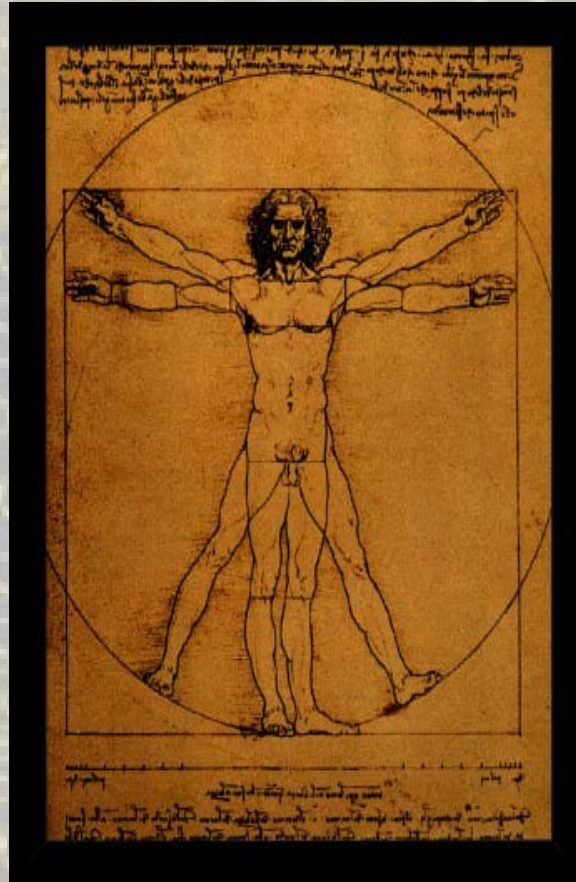


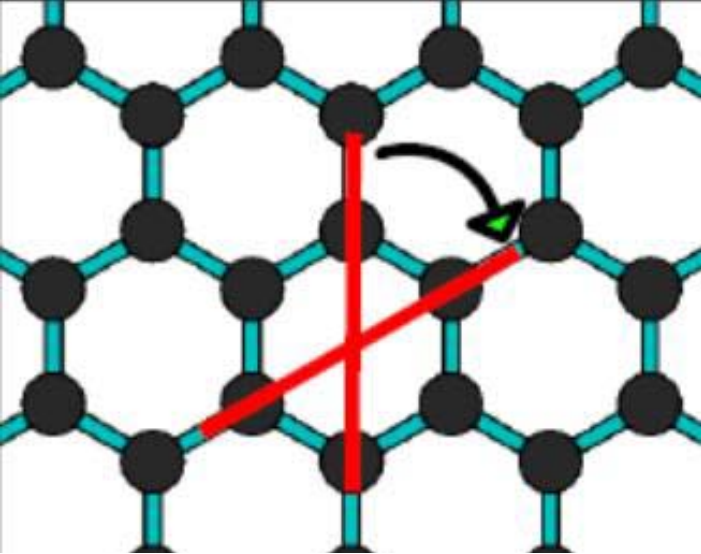
# Draaisymmetrie



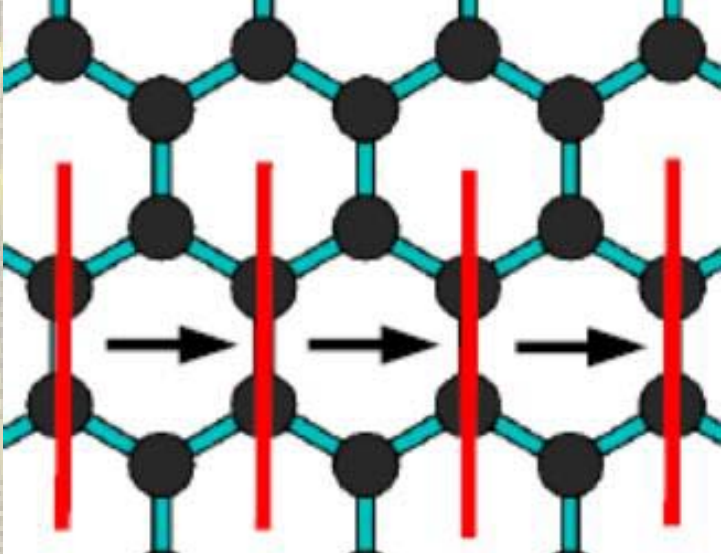
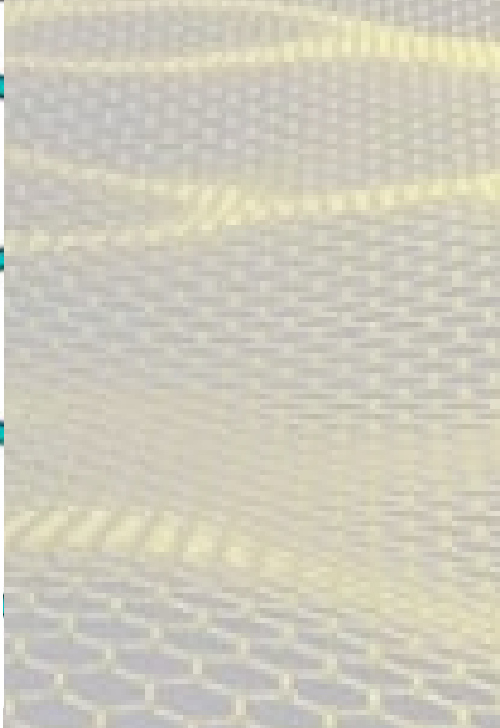


# Spiegelsymmetrie

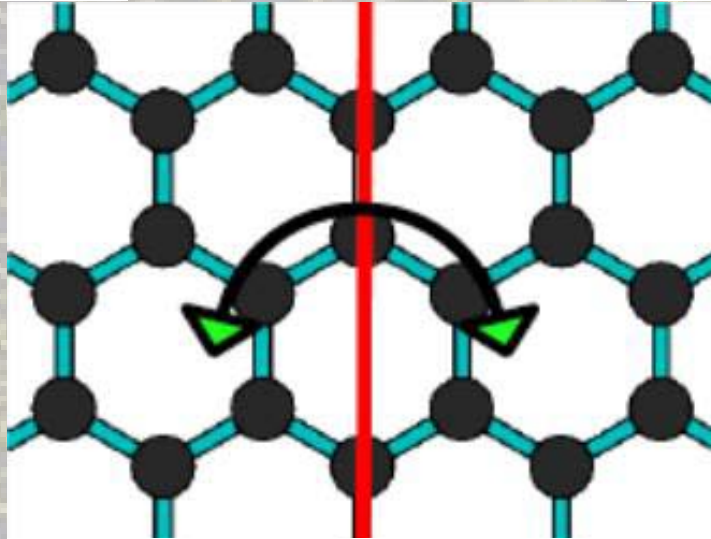
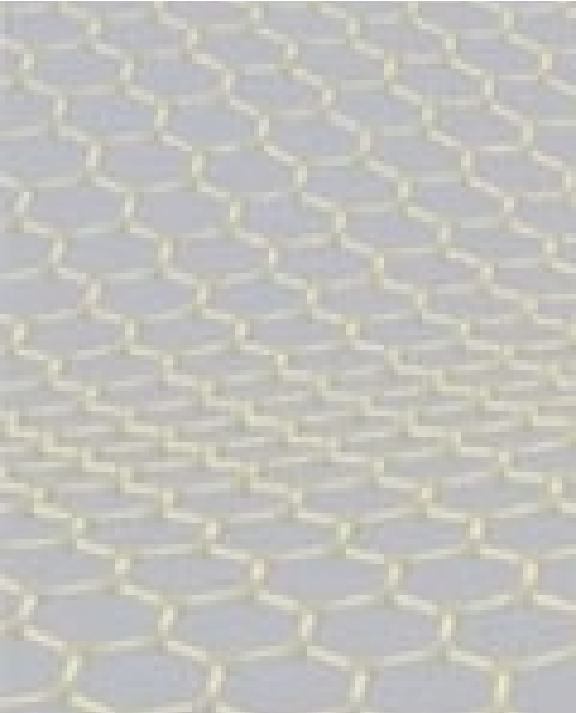




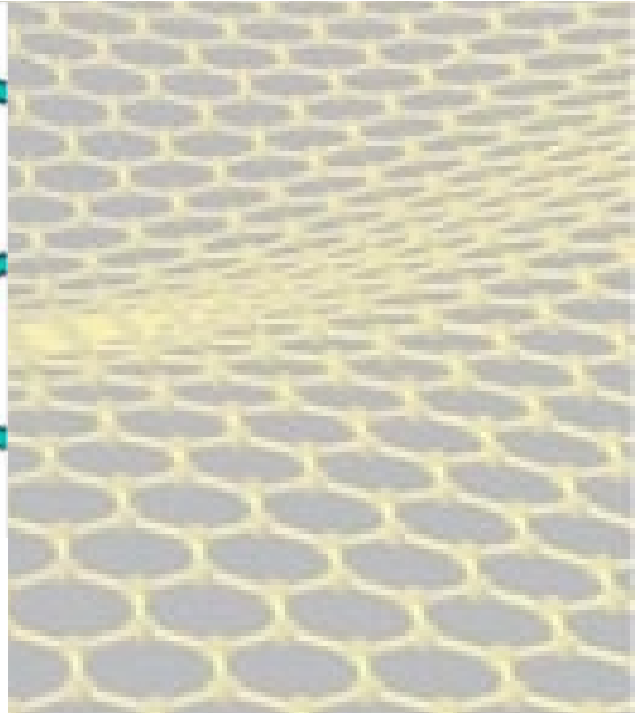
**Draaisymmetrie**



**Translatie  
symmetrie**



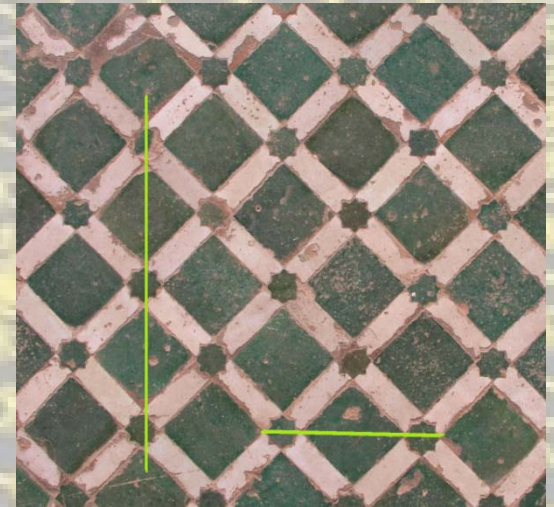
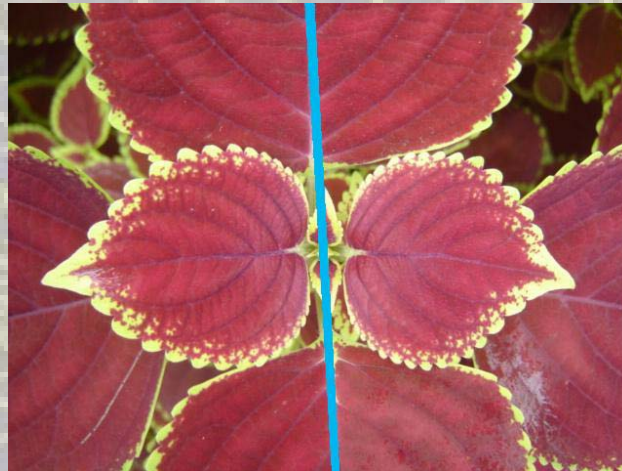
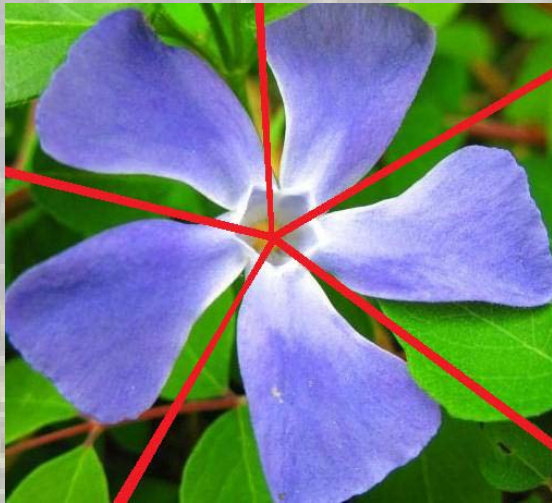
**Spiegelsymmetrie**



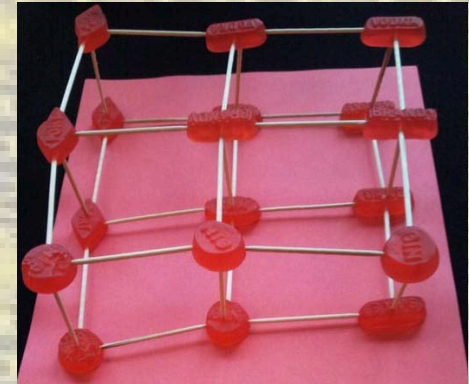
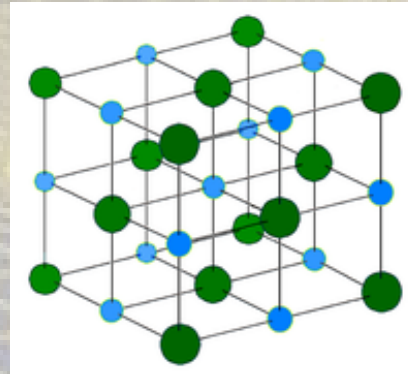


# Opdracht:

**Zoek op de afbeeldingen naar symmetrie.**



# Opdracht: Bouw je eigen kristal

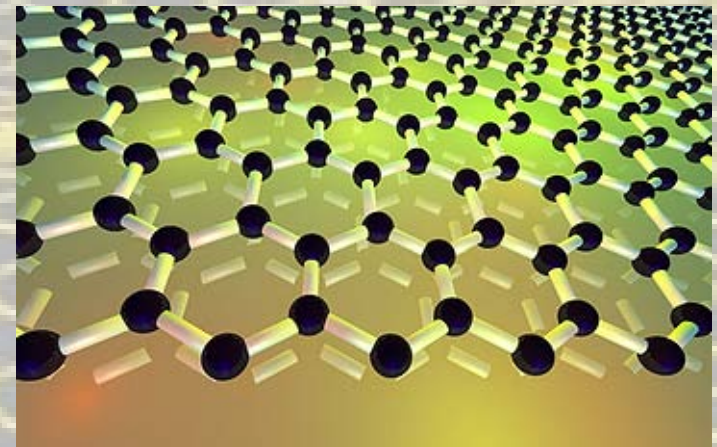
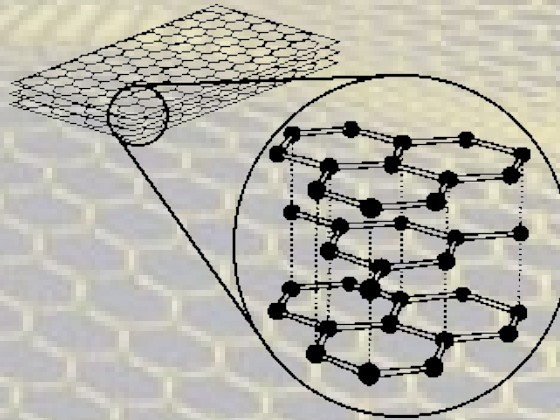


**Bijvoorbeeld een zoutkristal.**

**Let op!  
Er zitten basisvormen in de envelop.**

# Van kristal naar grafeen

Grafeen: een 2D kristalstructuur





# Grafeen, angst en terug naar het begin...

## Wetenschap in de klas

Winterschool 9 februari 2011

Deelnemers bedankt en tot  
de volgende Winterschool!