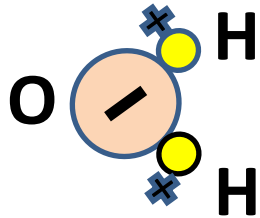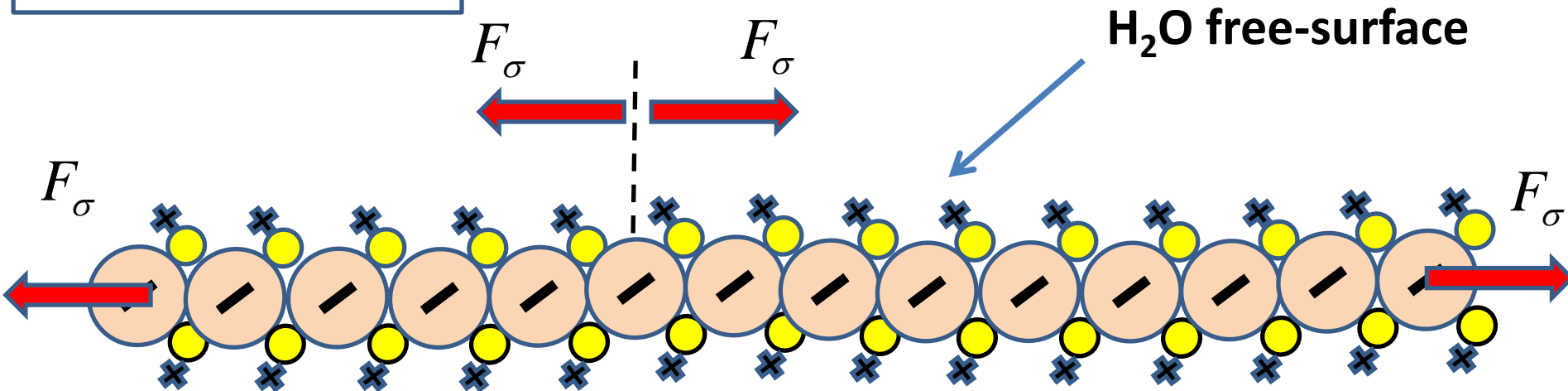# An engineer's perspective of surface tension
(by Spyros A. Kinnas, 2/1/12)

Molecule of H$_2$O with electrical charges

H

O

H

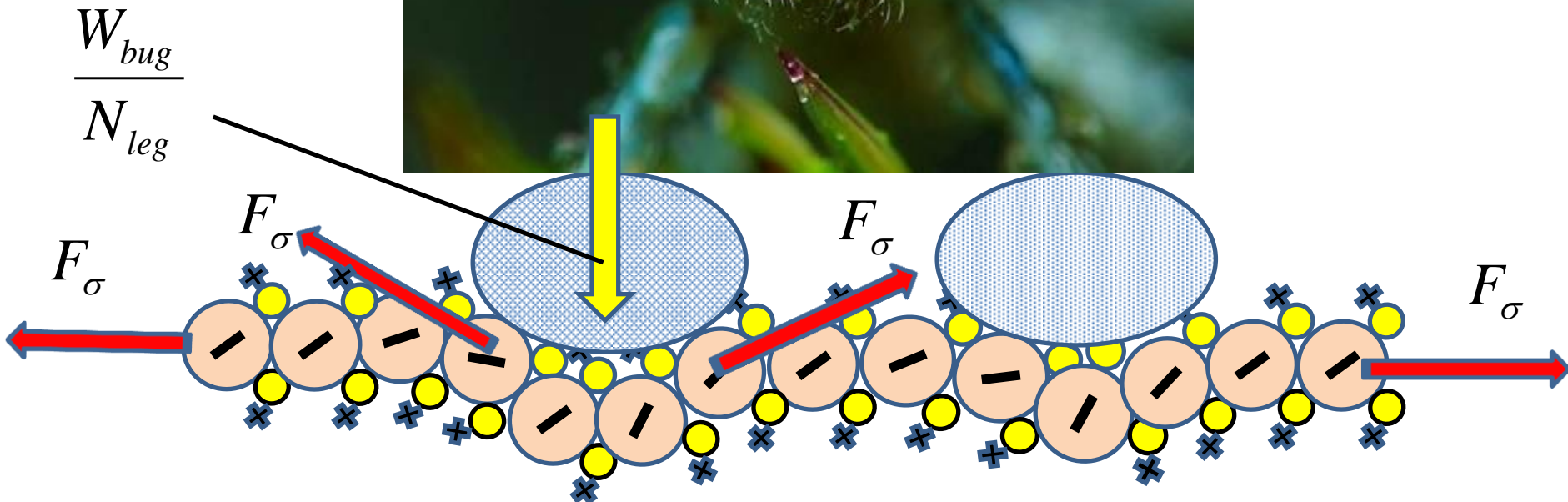Surface tension forces, F$_\sigma$, are due to attractive forces on each H$_2$O molecule, exerted by its immediate neighbors on the free-surface. Note, there are forces exerted by the neighbors, under the free-surface as well, but these will cancel also, due to equilibrium.

F_σ F_σ

H$_2$O free-surface
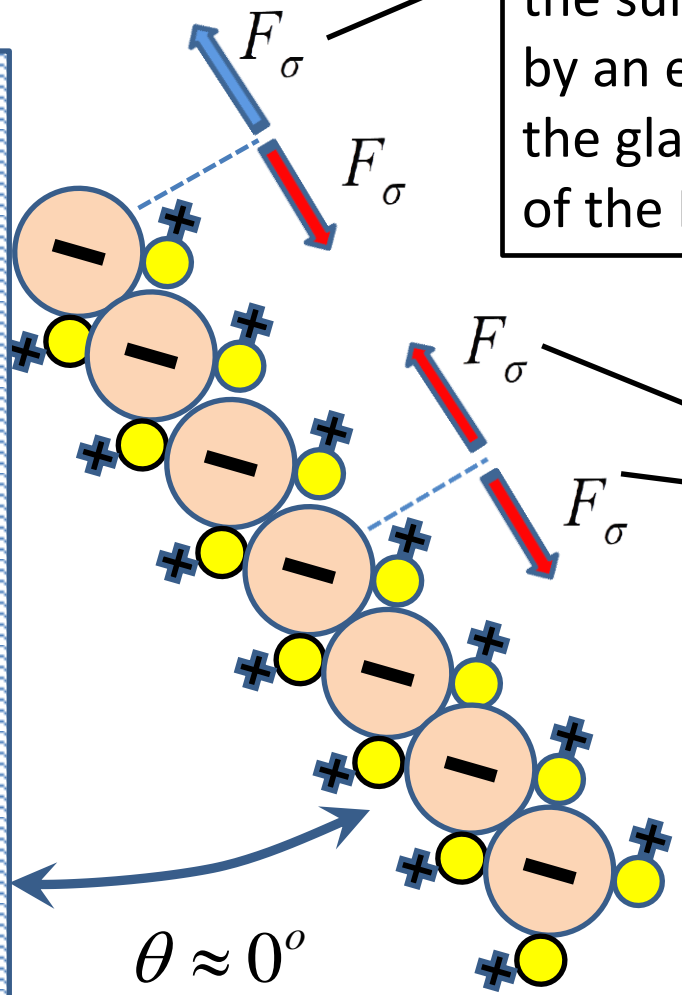
F_σ

F_σ

A chain of H$_2$O molecules linked by surface tension forces

The H$_2$O free-surface as a <u>trampoline</u> for bugs!

$$\frac{W_{bug}}{N_{leg}}$$

F_σ F_σ F_σ F_σ

Capillary *Rise!*

F_σ

F_σ

For the molecules next to the glass surface, the surface tension force must be balanced by an equal and opposite force exerted by the glass. This force is responsible for the rise of the H_2O surface inside capillary tubes

Glass

F_σ

F_σ

Surface tension forces are due to attractive forces on each H_2O molecule, exerted by its immediate neighbors on the free-surface.

$\theta \approx 0^o$

An engineer's prespective of surface tension - Copyright: S.A. Kinnas, 2012