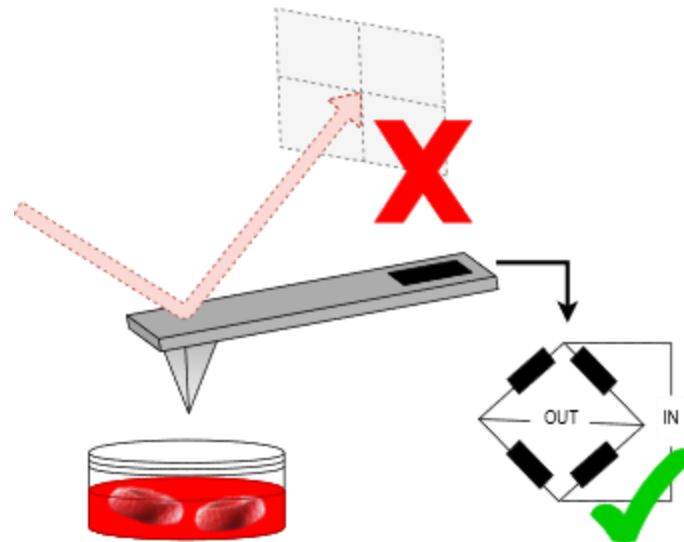


# Im Dunkeln tappen

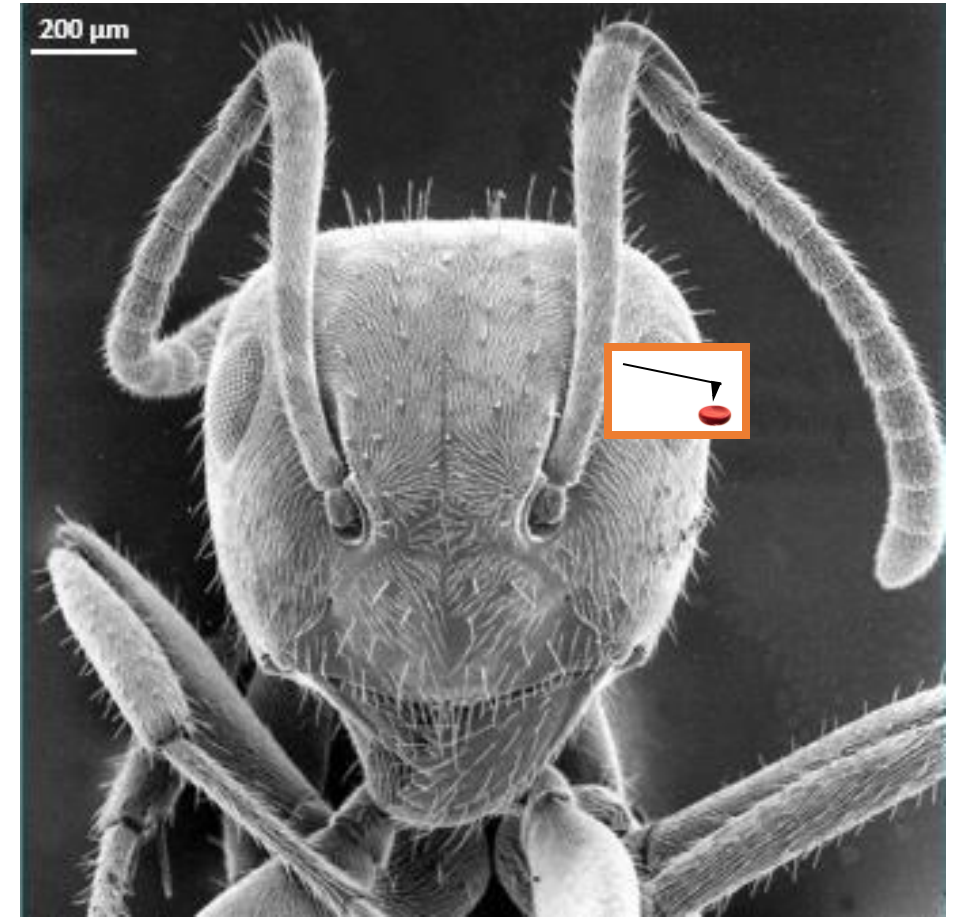
– wie man Zellen im Blut ertastet

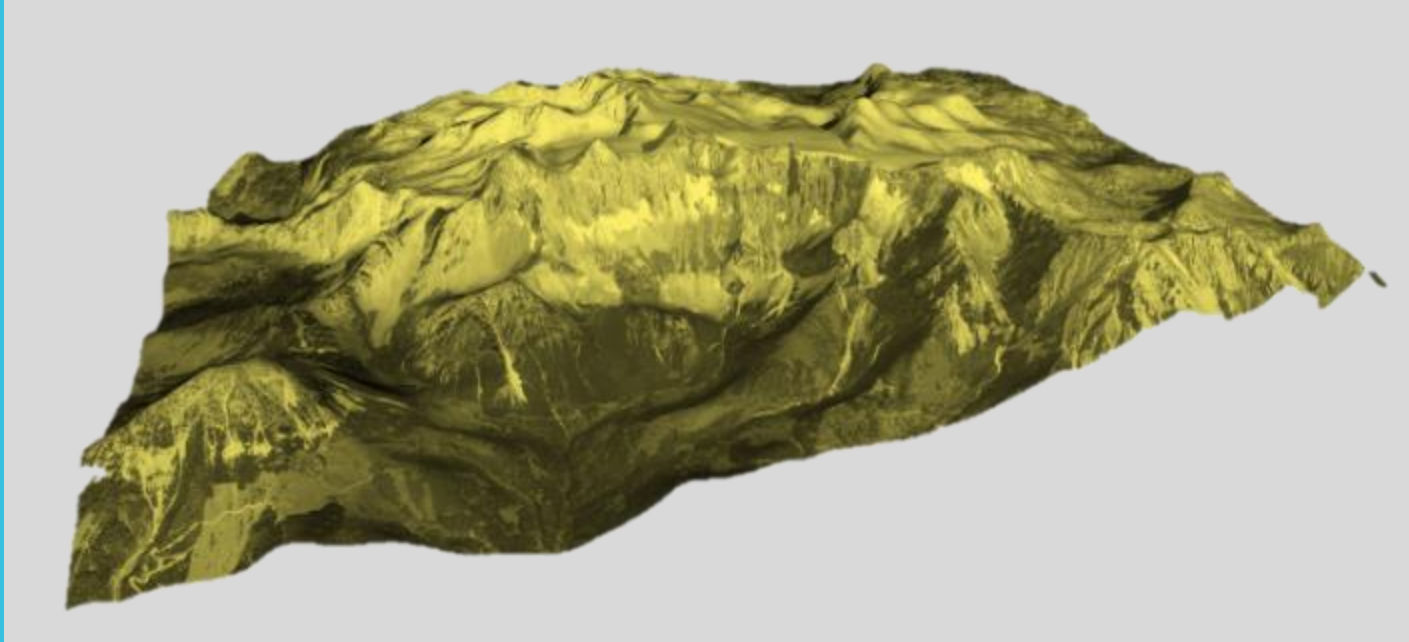
Hannah Seferovic

Macke Award Präsentation 2019

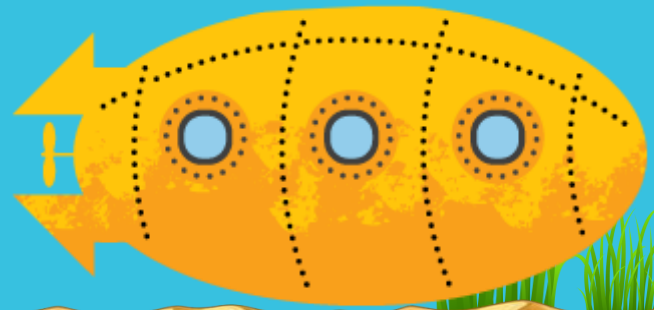


# Rasterkraftmikroskopie (Atomic force microscopy; AFM)



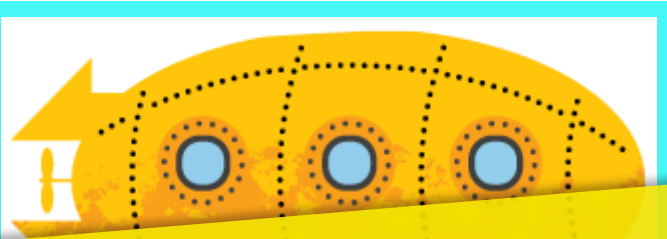


**Höhe: -253 m**



REIN  
LUFT  
RAUS

# SUBMARINE SELECT



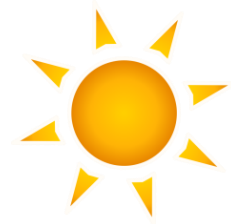
SUMSUM

DIE PRINZESSIN

SCIENCE DOGE

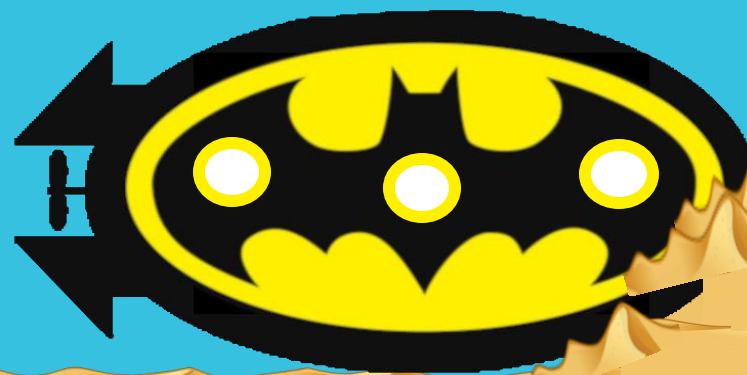
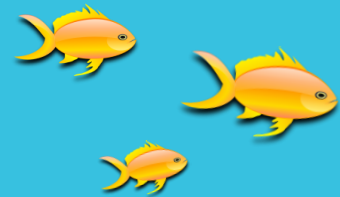


LEVEL 1



REIN  
LUFT  
RAUS

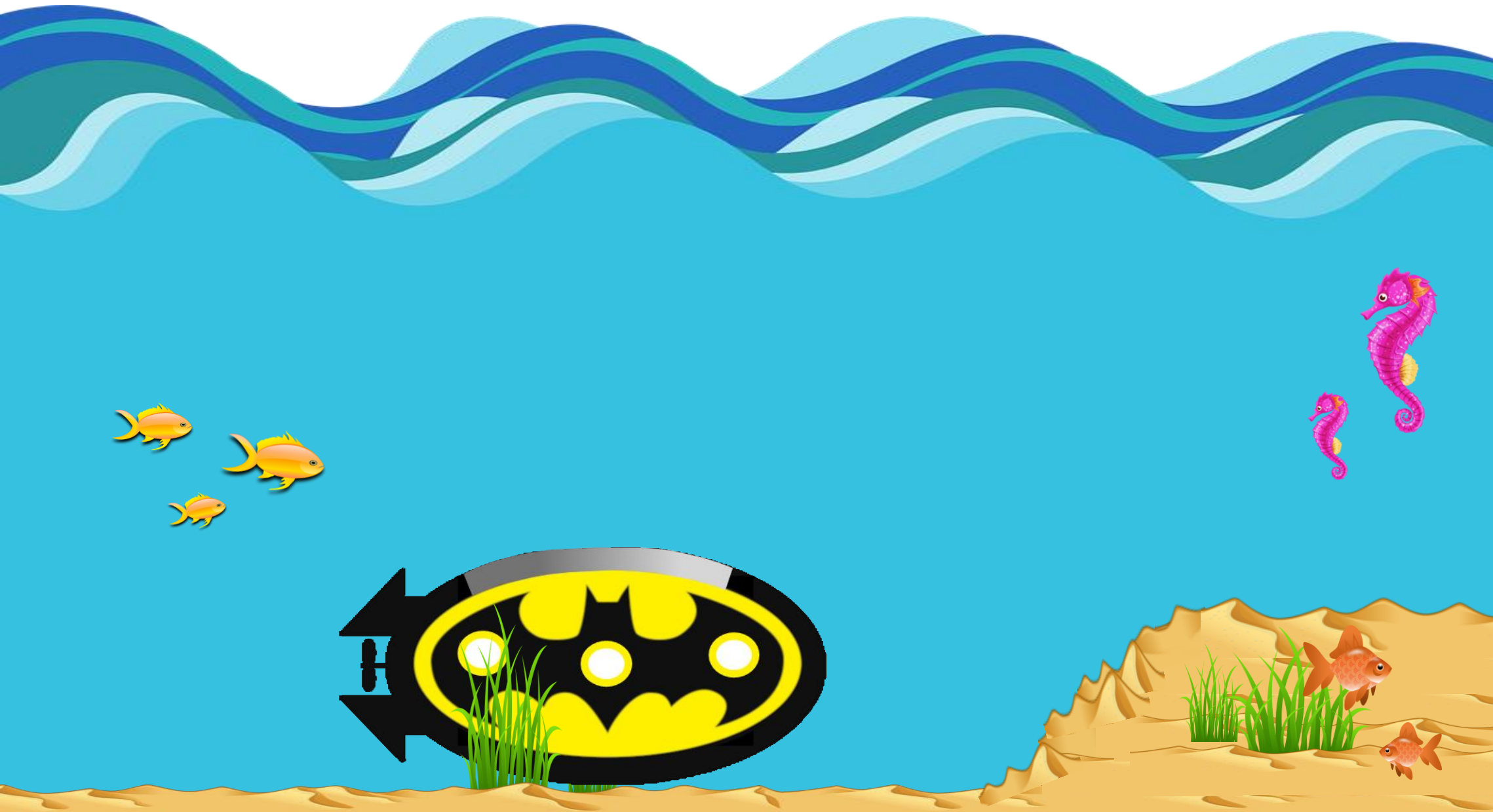
# PROBIER'S NOCHMAL! LEVEL 2



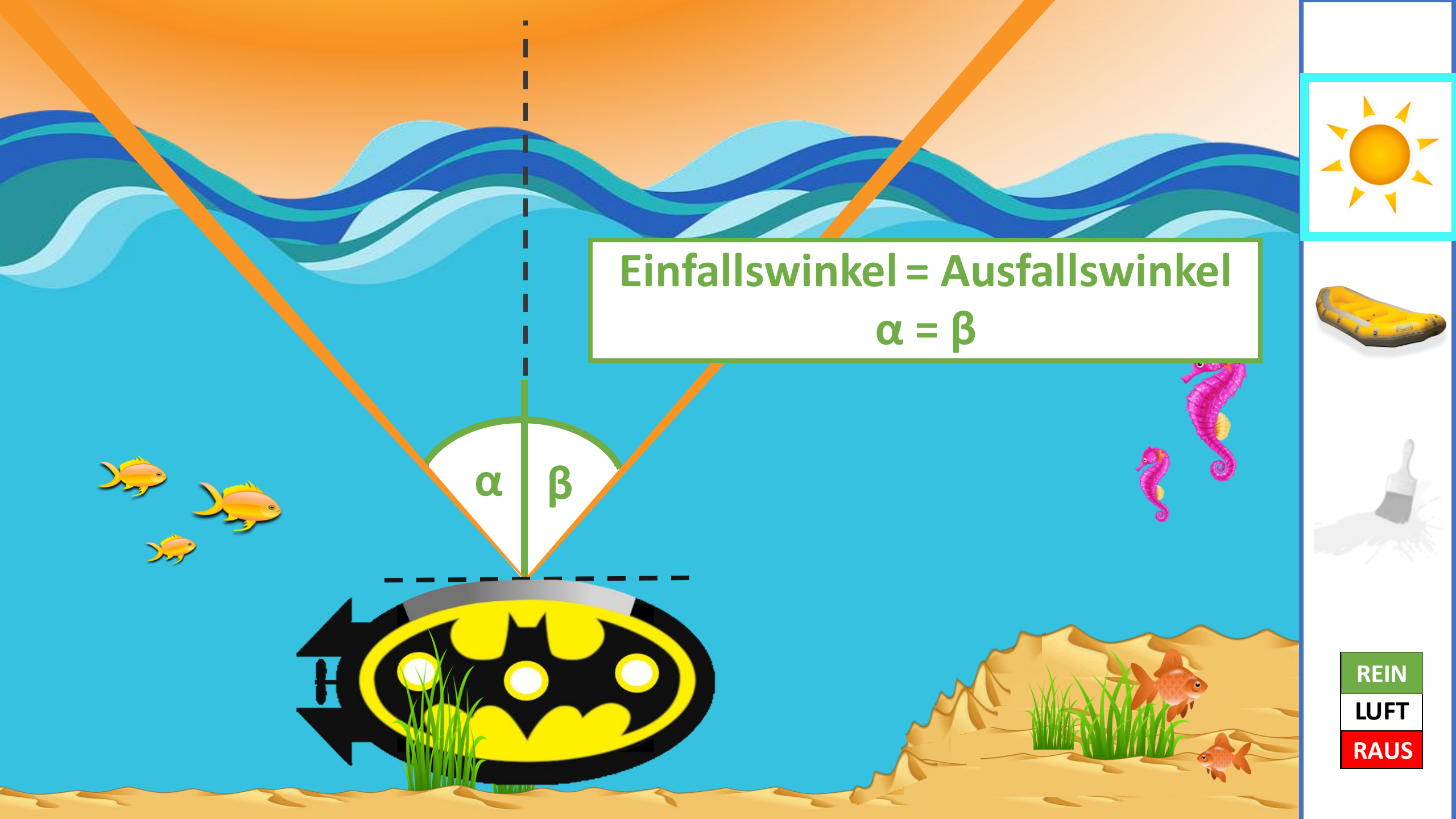
REIN

LUFT

RAUS



REIN  
LUFT  
RAUS

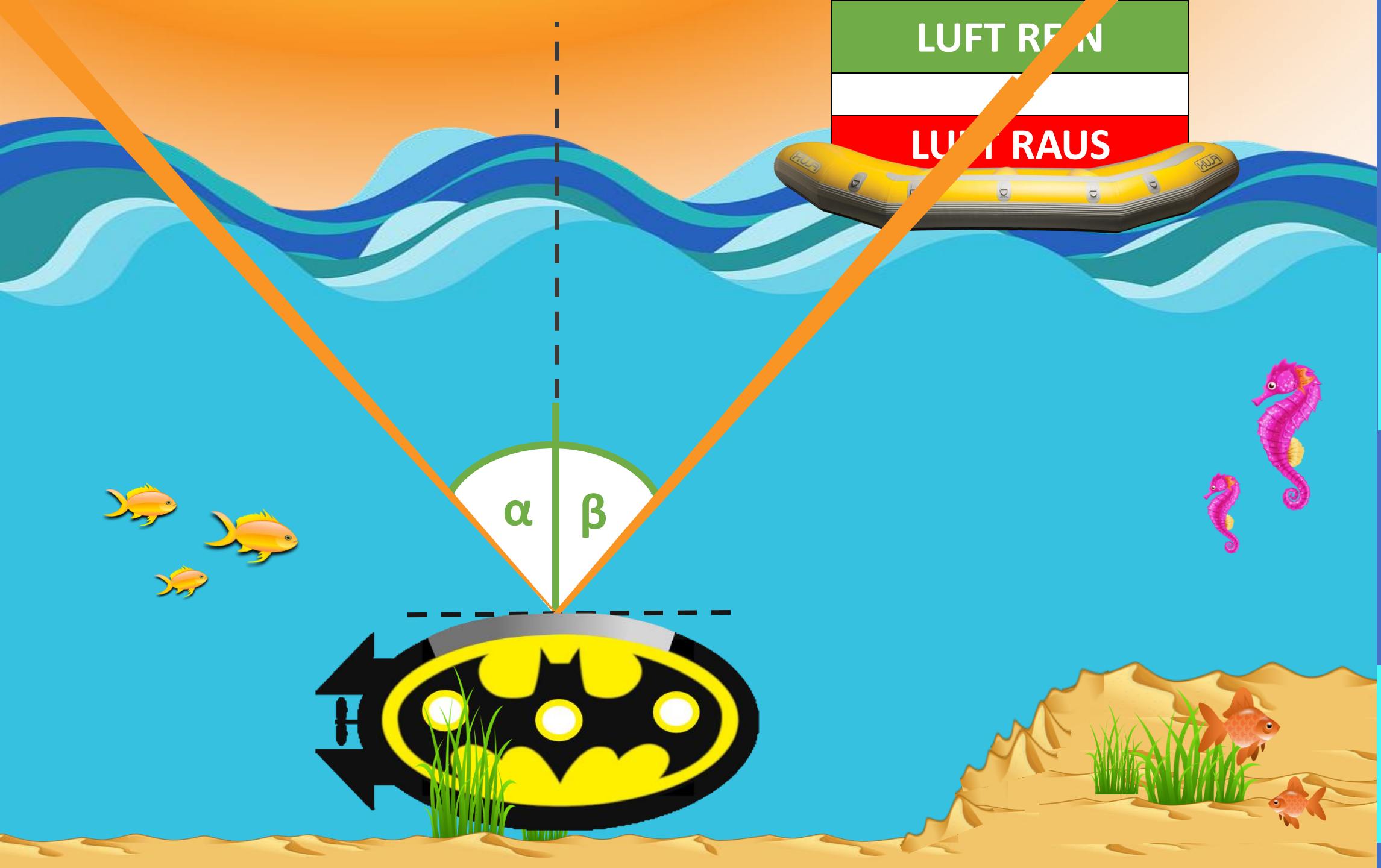


Einfallswinkel = Ausfallswinkel  
 $\alpha = \beta$

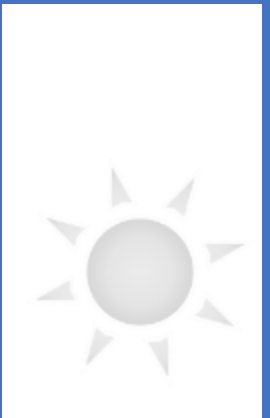


REIN  
LUFT  
RAUS





LUFT REIN  
LUFT RAUS



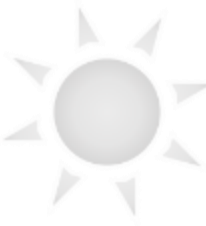
REIN  
LUFT  
RAUS

LUFT REIN

LUFT RAUS

Einfallswinkel = Ausfallwinkel  
 $\gamma = \delta$

$\gamma$   $\delta$



REIN

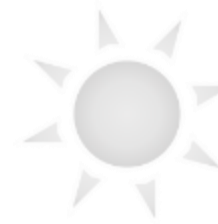
LUFT

RAUS

LUFT REIN

LUFT RAUS

LEVEL 2



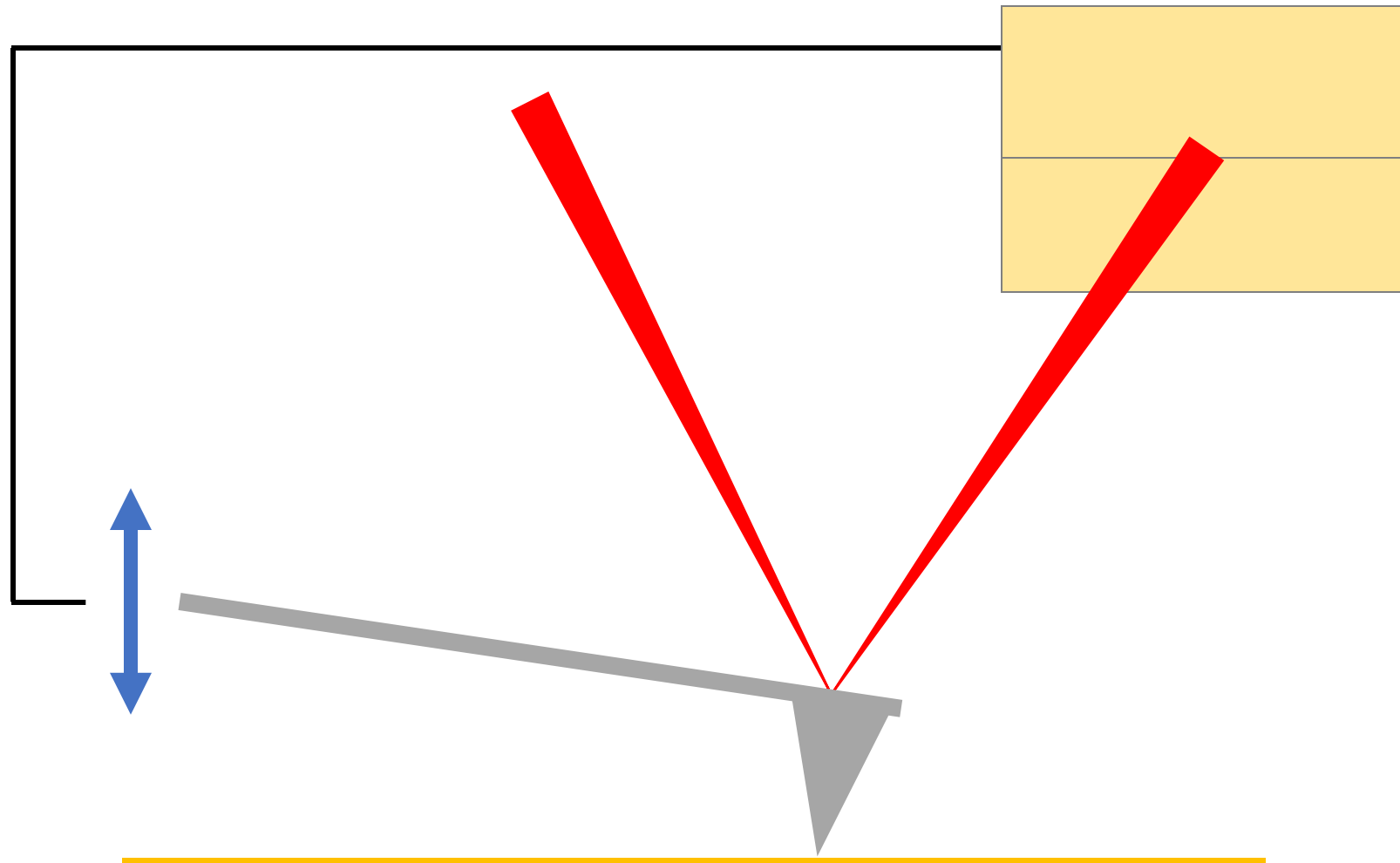
REIN

LUFT

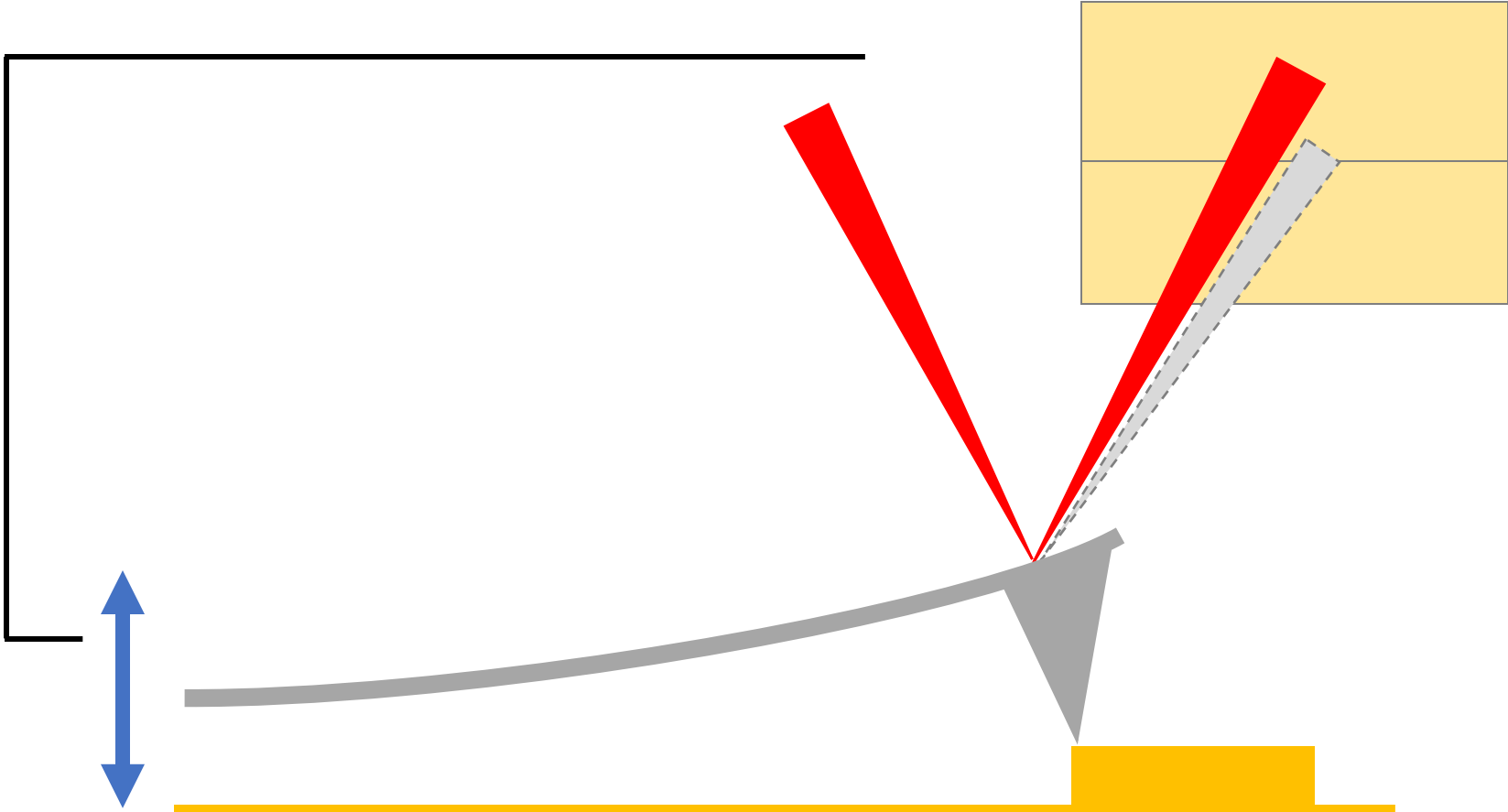
RAUS



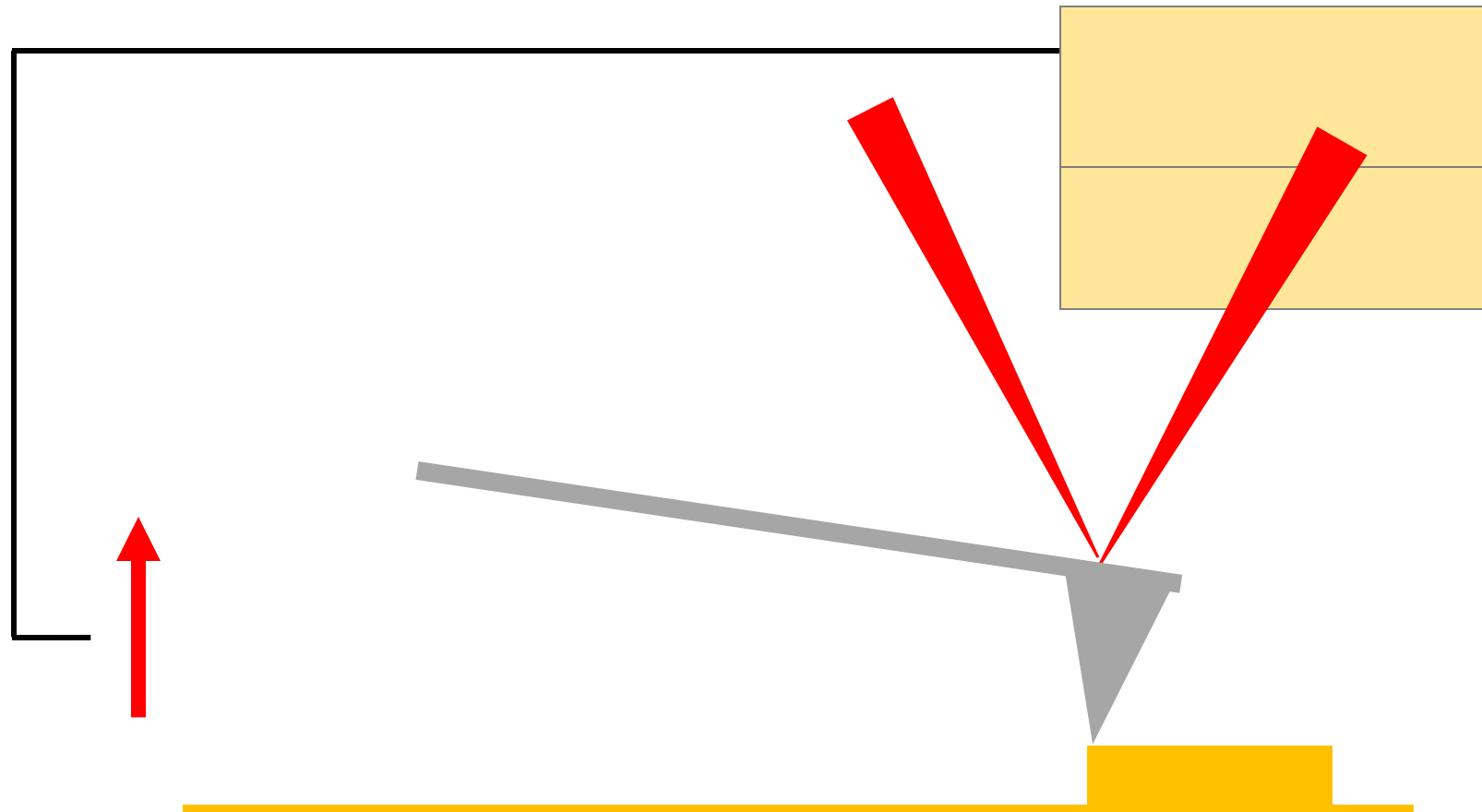
# Rasterkraftmikroskopie mit Laserlichtauslese



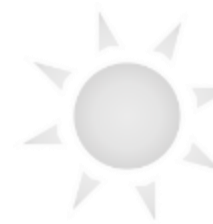
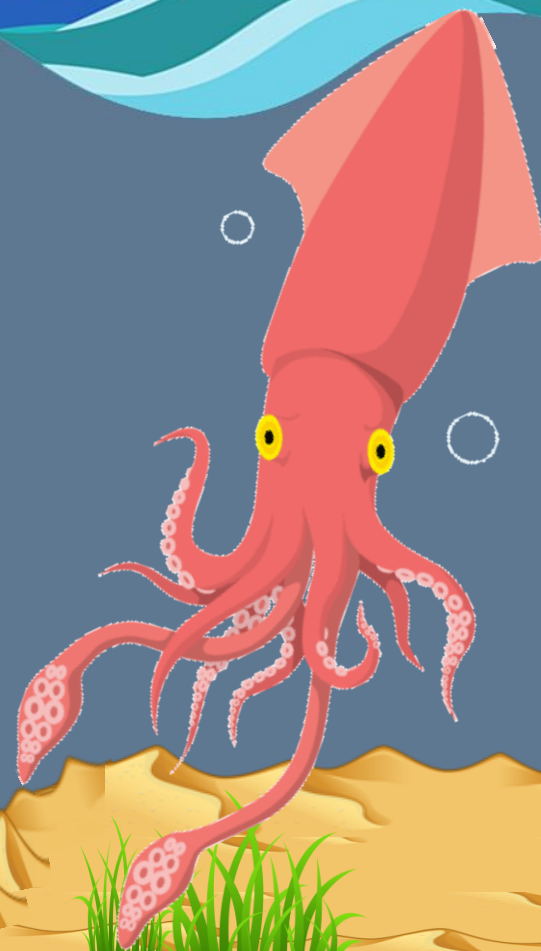
# Rasterkraftmikroskopie mit Laserlichtauslese



# Rasterkraftmikroskopie mit Laserlichtauslese



**UPS!** LEVEL 3  
**GLEICH NOCH EINMAL!**

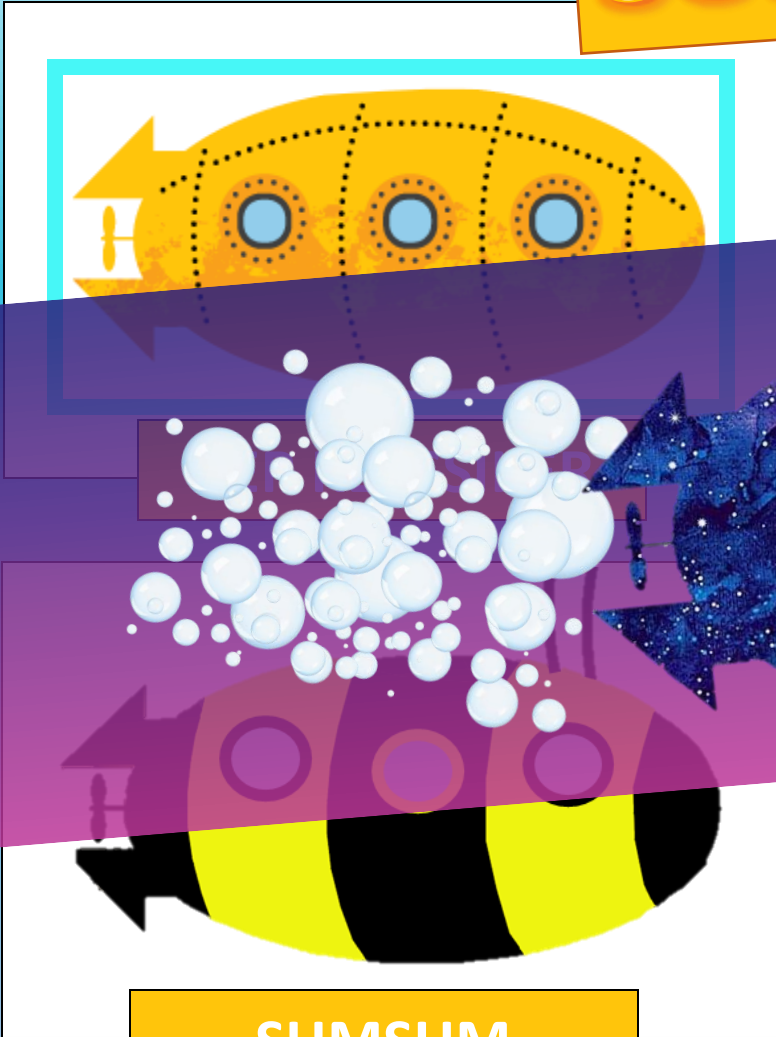


REIN

LUFT

RAUS

# SUBMARINE SELECT



SUMSUM



DIE PRINZESSIN

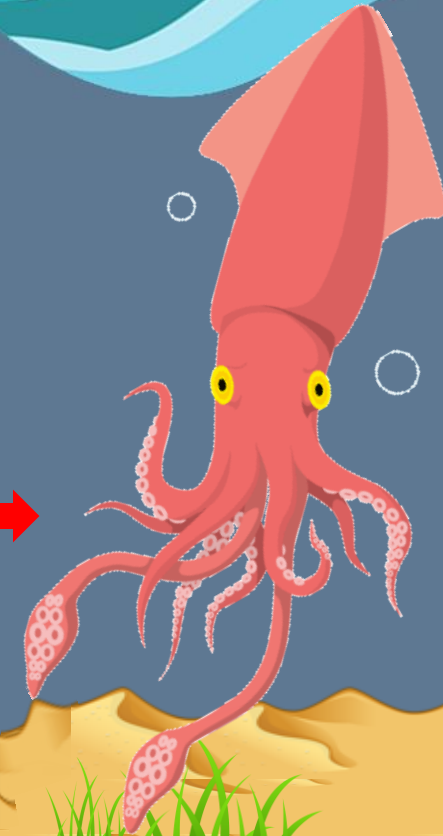


SCIENCE DOGE

★  
SUCH  
SELF-SENSING  
★ ★

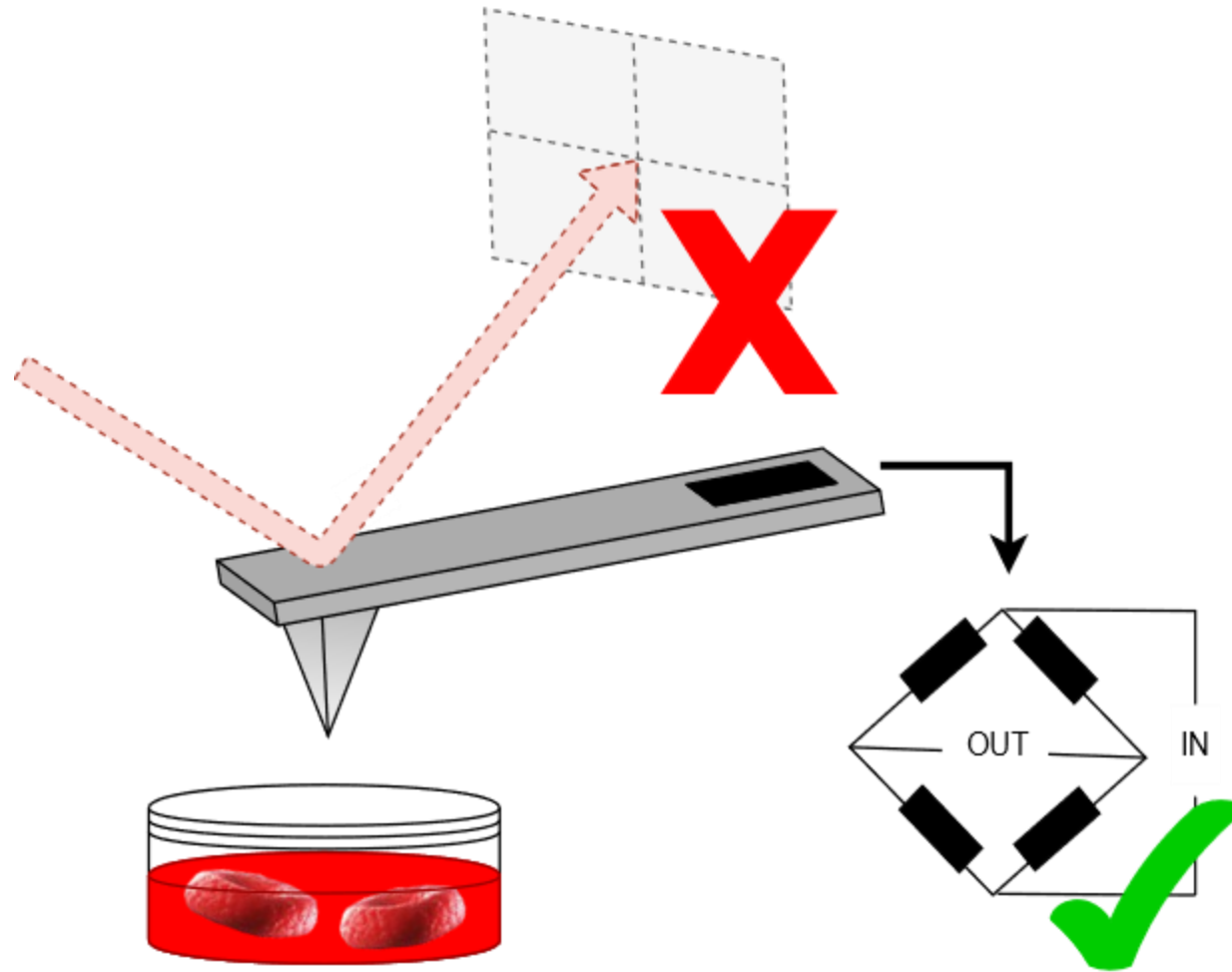


LEVEL 3

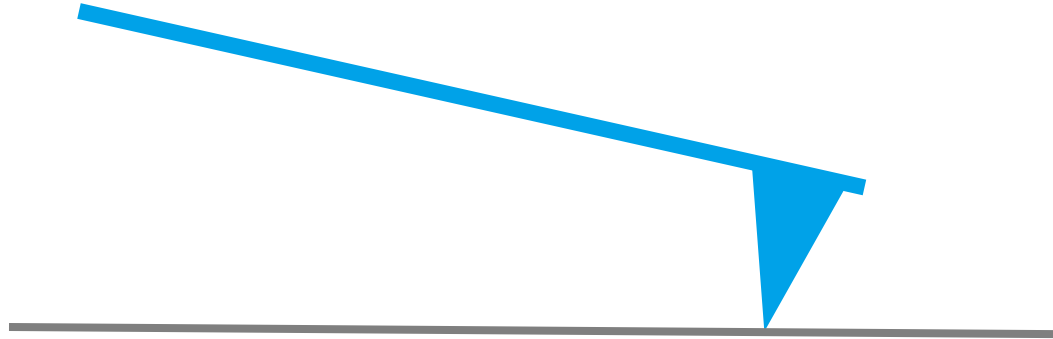


REIN  
LUFT  
RAUS

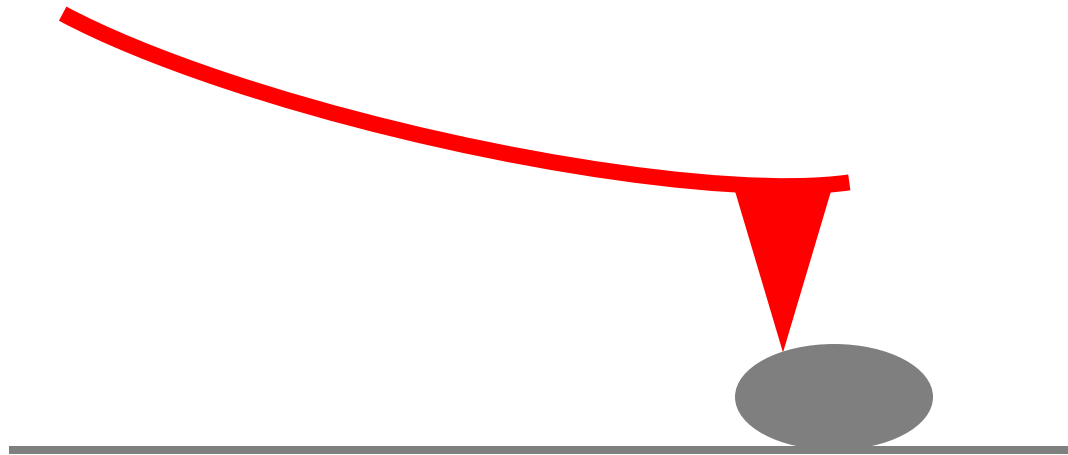
# Cantilever mit Piezowiderständen



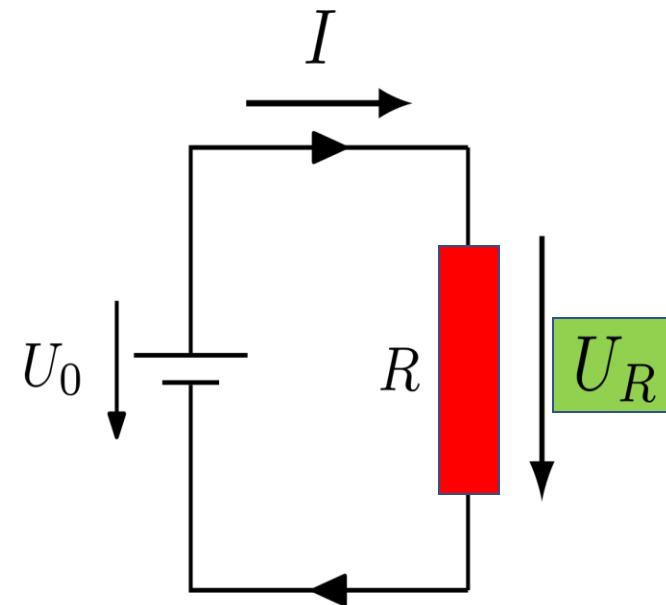
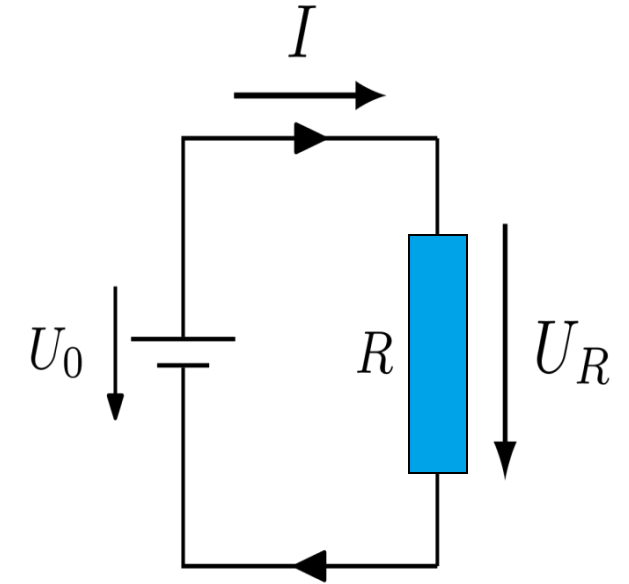
# Cantilever mit Piezowiderständen



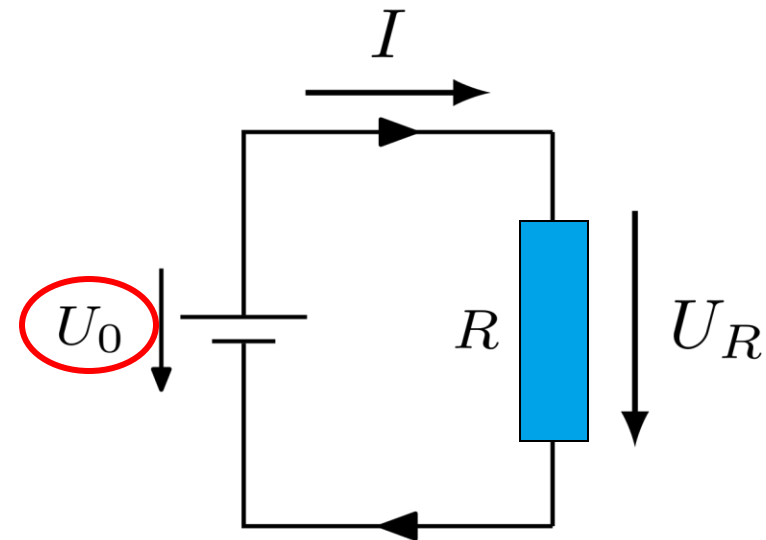
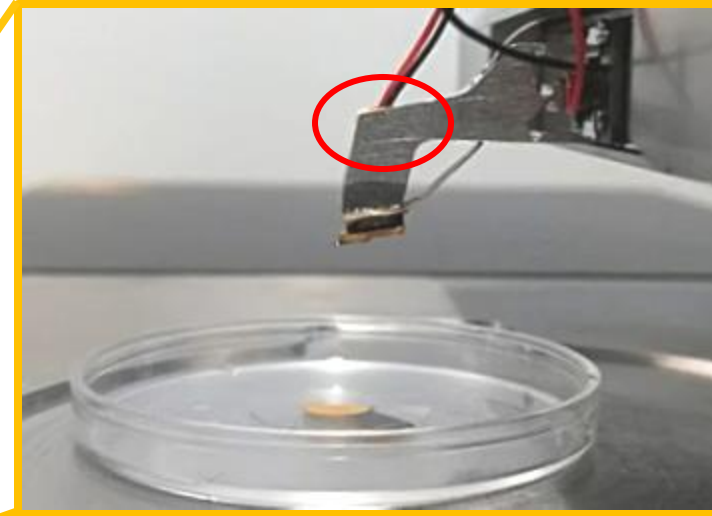
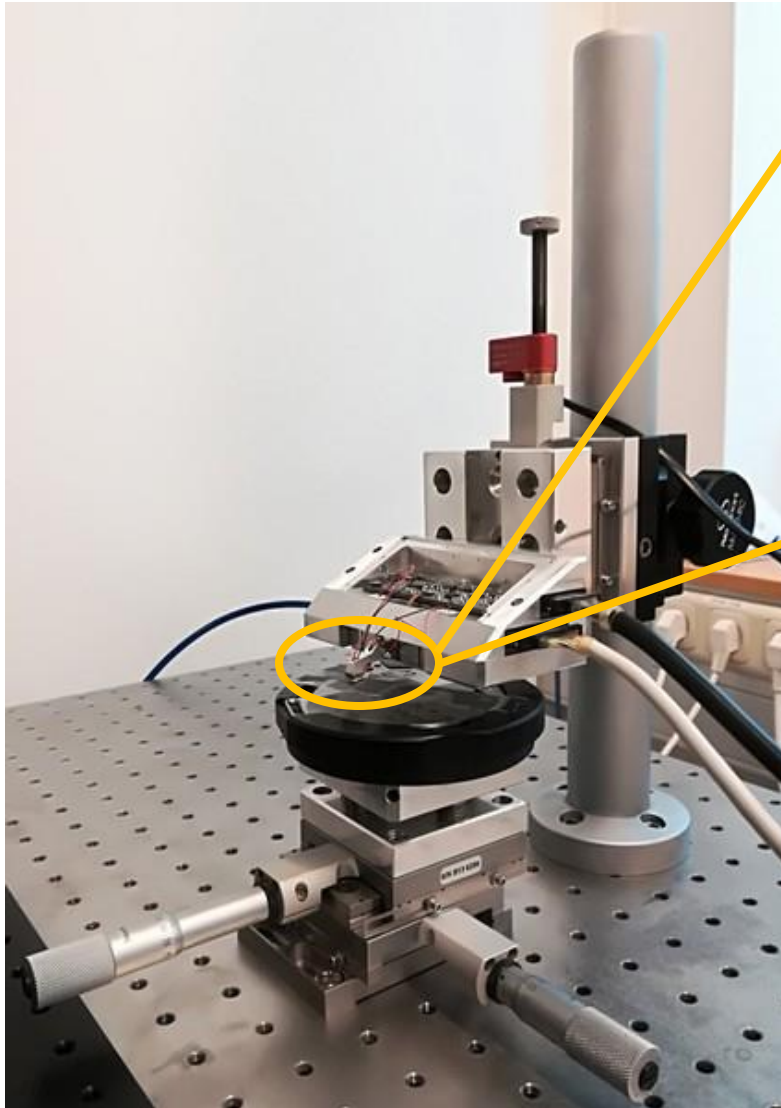
$$U_R = R \cdot I$$



$$U_R = R \cdot I$$

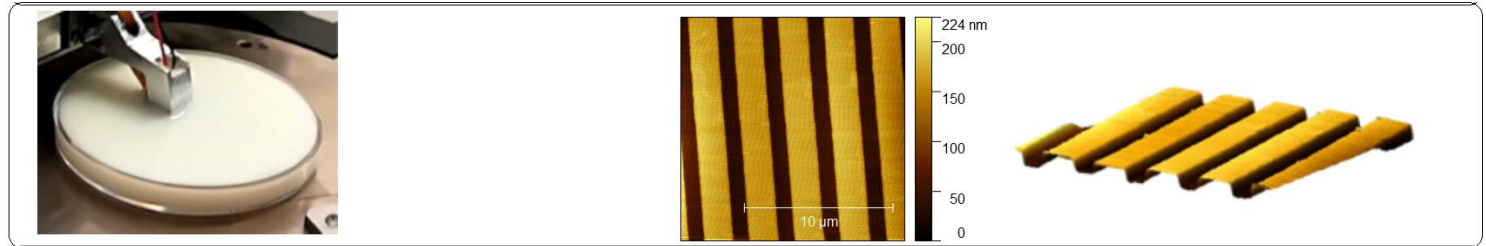


# Messung in trüben Flüssigkeiten

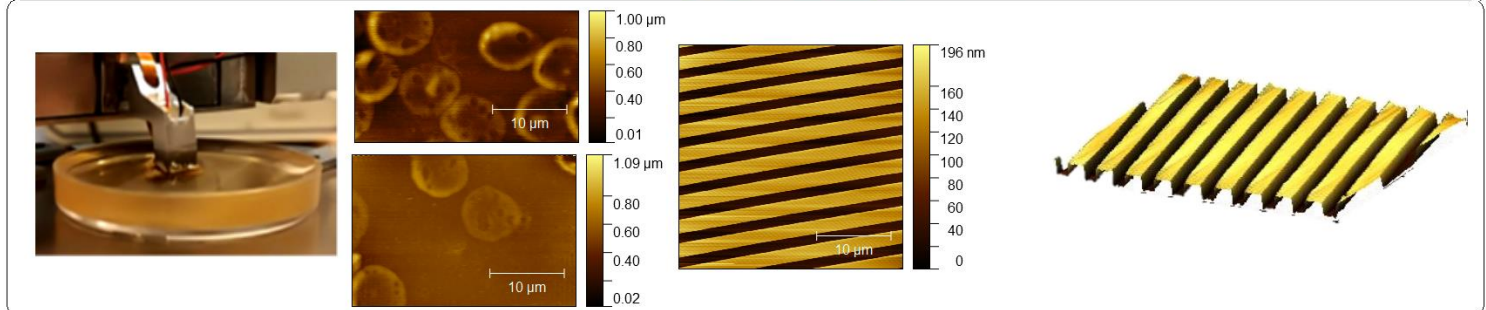


# Messung in trüben Flüssigkeiten

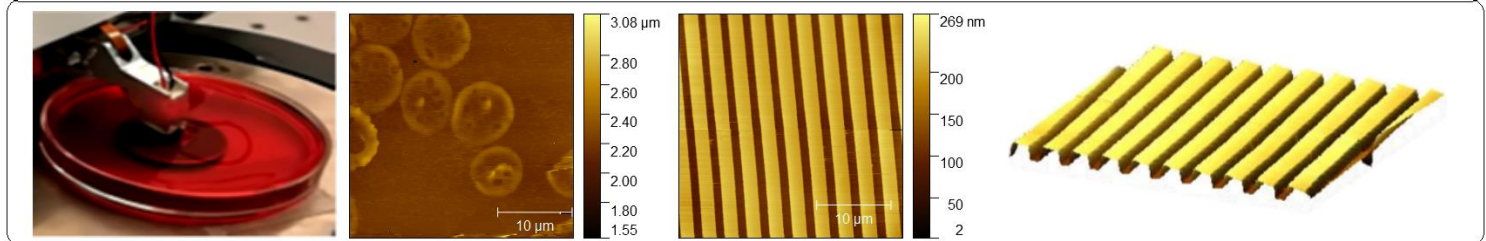
Milch



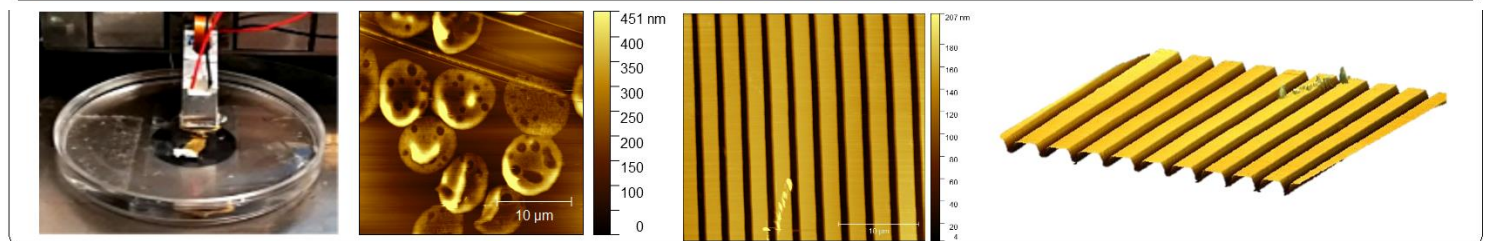
verdünntes Serum (1:3)



verdünntes Blut (1:8)



deionisiertes Wasser

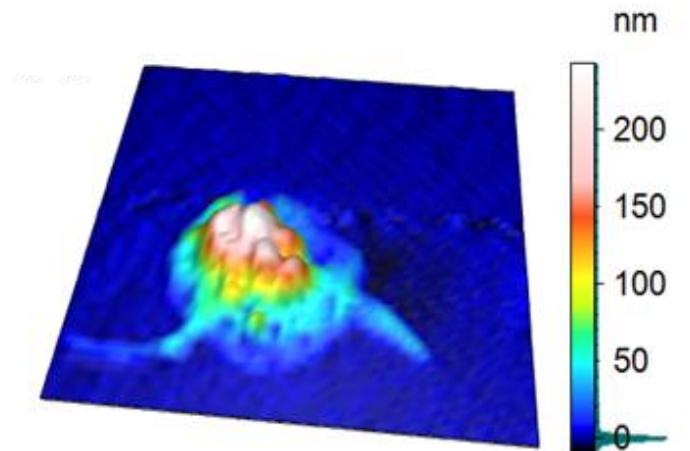
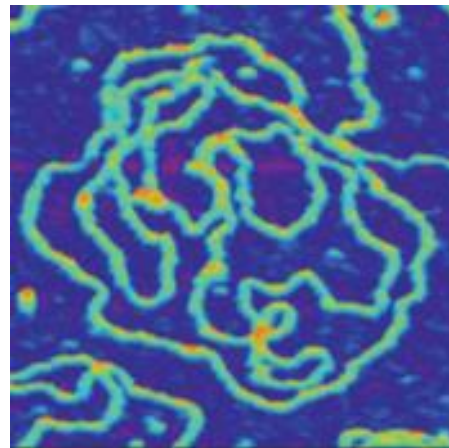
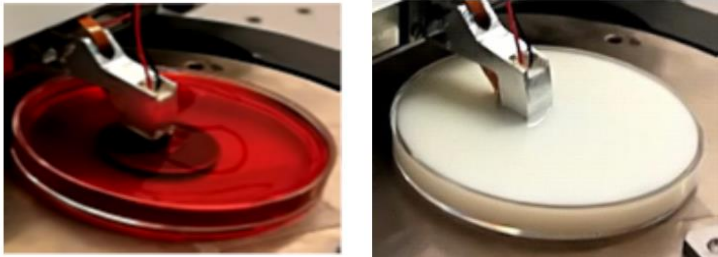


# RASTERKRAFTMIKROSKOPIE WARUM?

FLÜSSIGKEIT  
=  
NATÜRLICHE UMGEBUNG

DARSTELLUNG KLEINSTER  
STRUKTUREN

3D GESTALT





**WILHELM MACKE  
STIPENDIEN  
PRIVATSTIFTUNG**



**Danke für eure Aufmerksamkeit!**





# BILDQUELLEN

**Freigestellte Bilder** *png.com, PNG images and cliparts for web design  
(<http://pngimg.com/>)*

**Ameise auf Hand** *TECHTAG  
(<https://www.techtag.de/>)*

**Elektronenmikroskopiebild Ameisenkopf** *University of Victoria, Advanced Microscopy Facilities,  
(<https://www.uvic.ca/research/advancedmicroscopy/>)*

**Rotes Blutkörperchen** *<https://de.kisspng.com/>*

**3D Modell – Dachstein Mountain Range in  
Austria** *3DEXPORT ([de.3dexport.com](http://de.3dexport.com))*