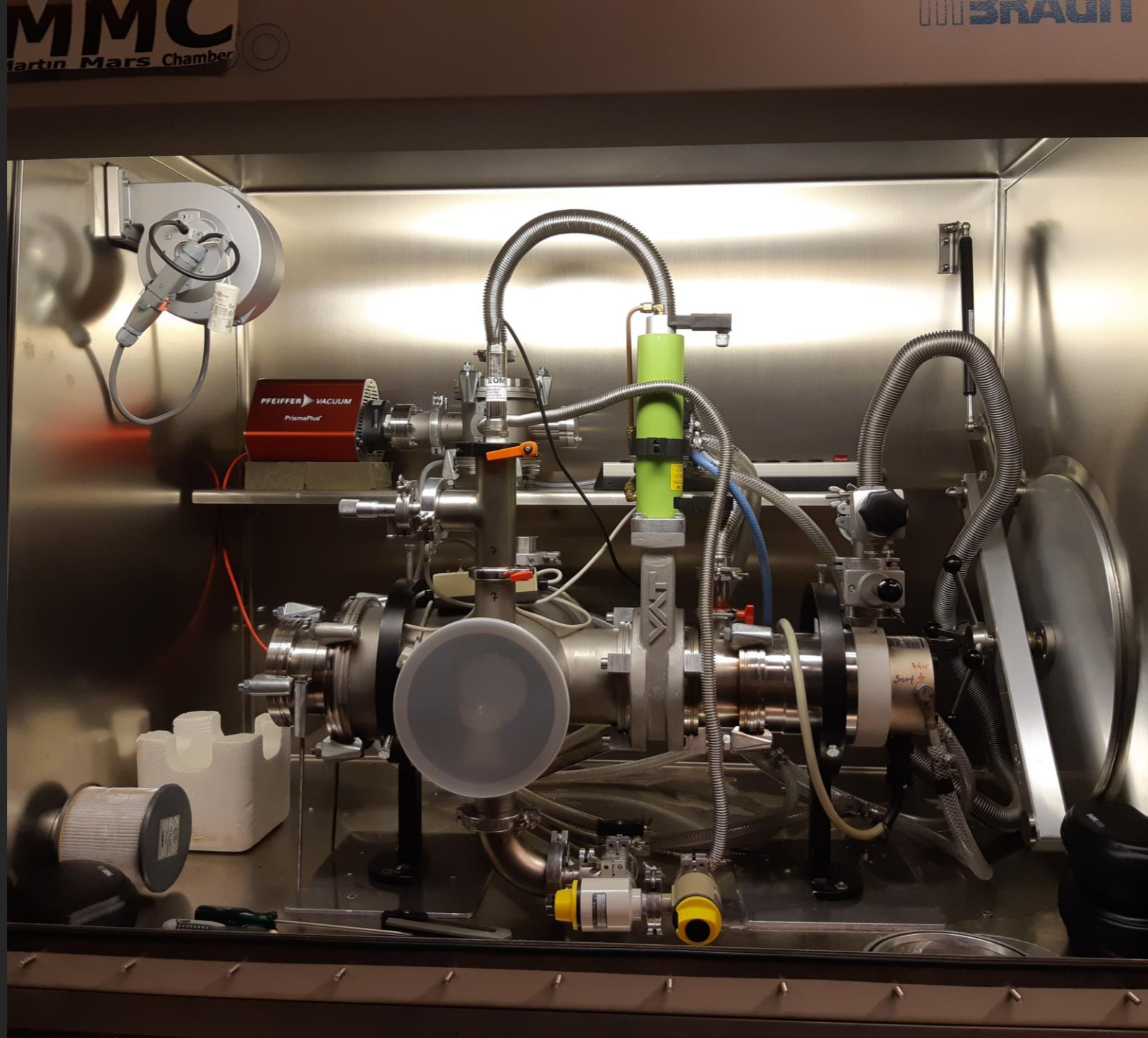
The Mars simulation chamber

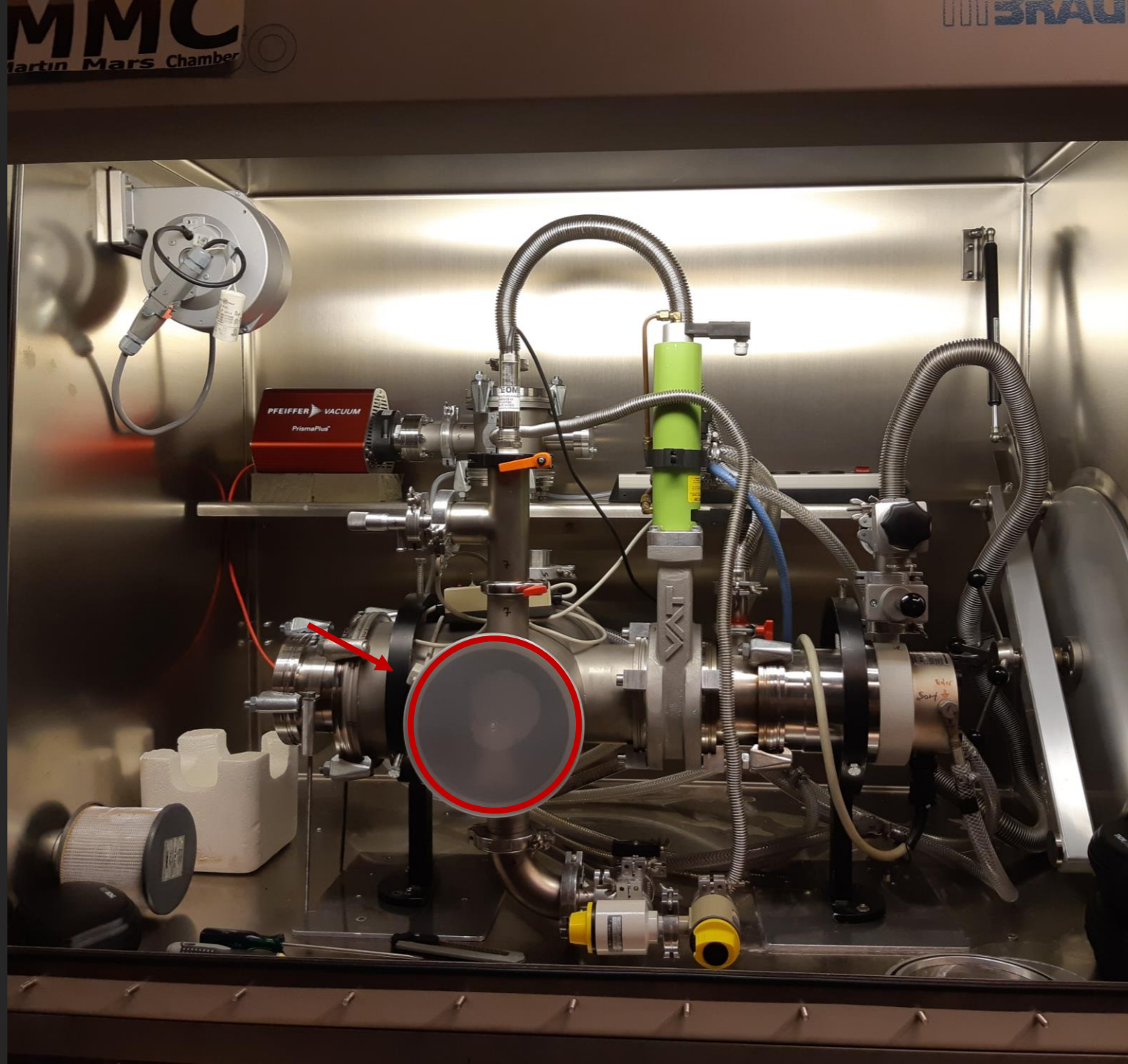
Overview

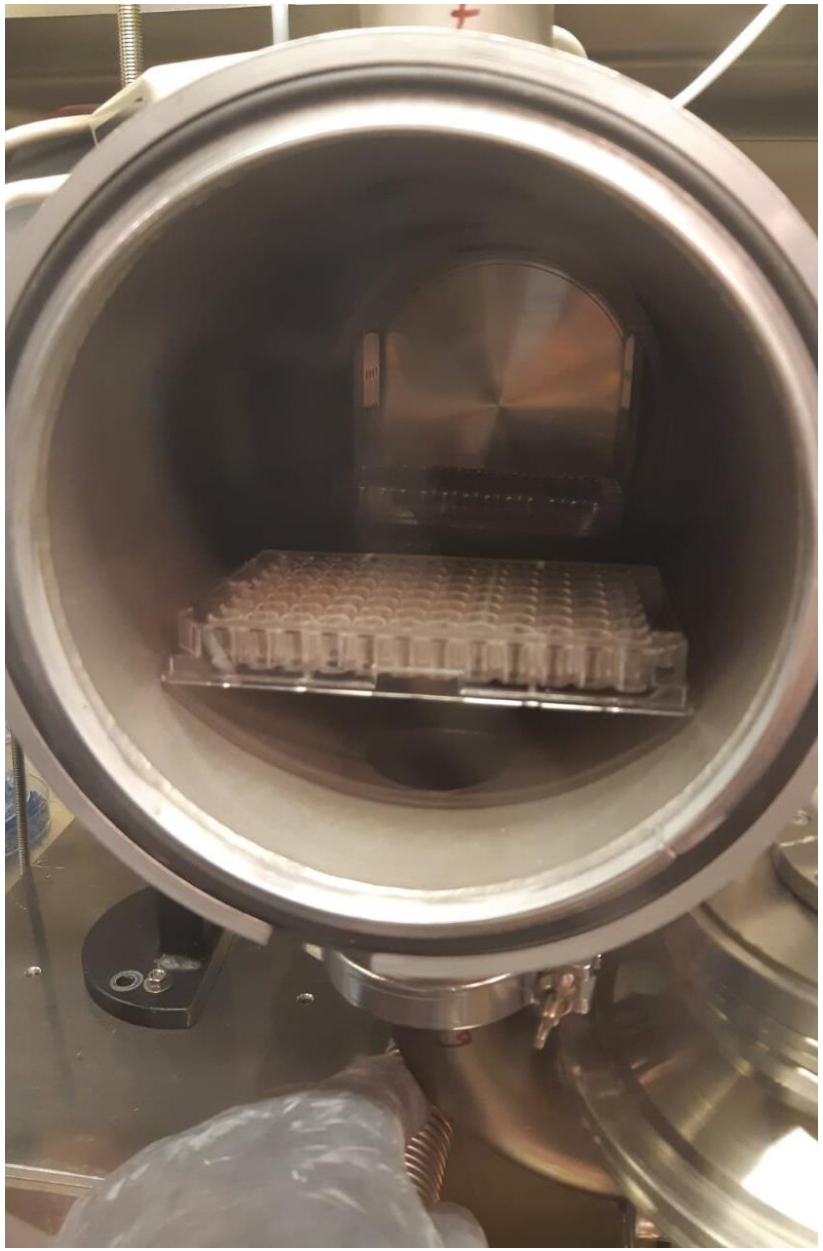
- The chamber
- The experiment
- The individual experiment
- The calculations

The Mars simulation chamber

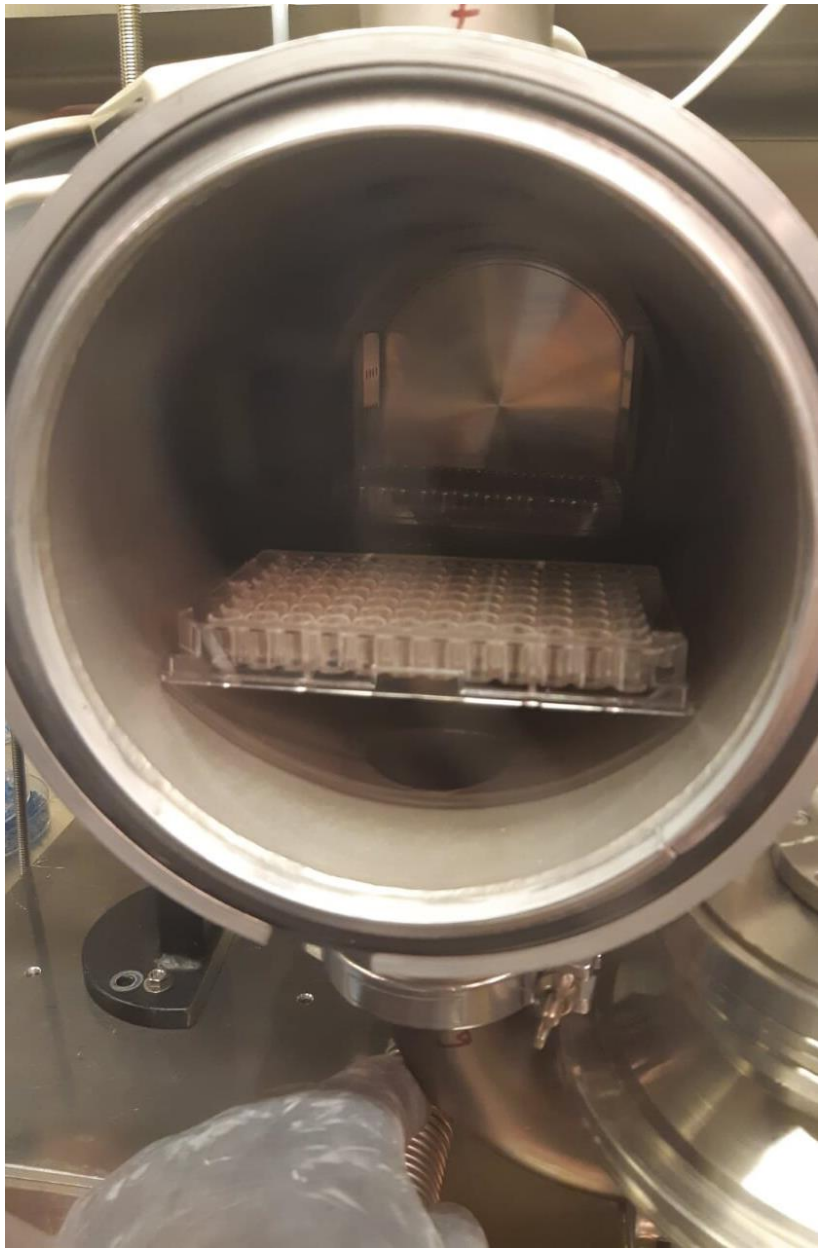


The Mars simulation chamber





Bacteria

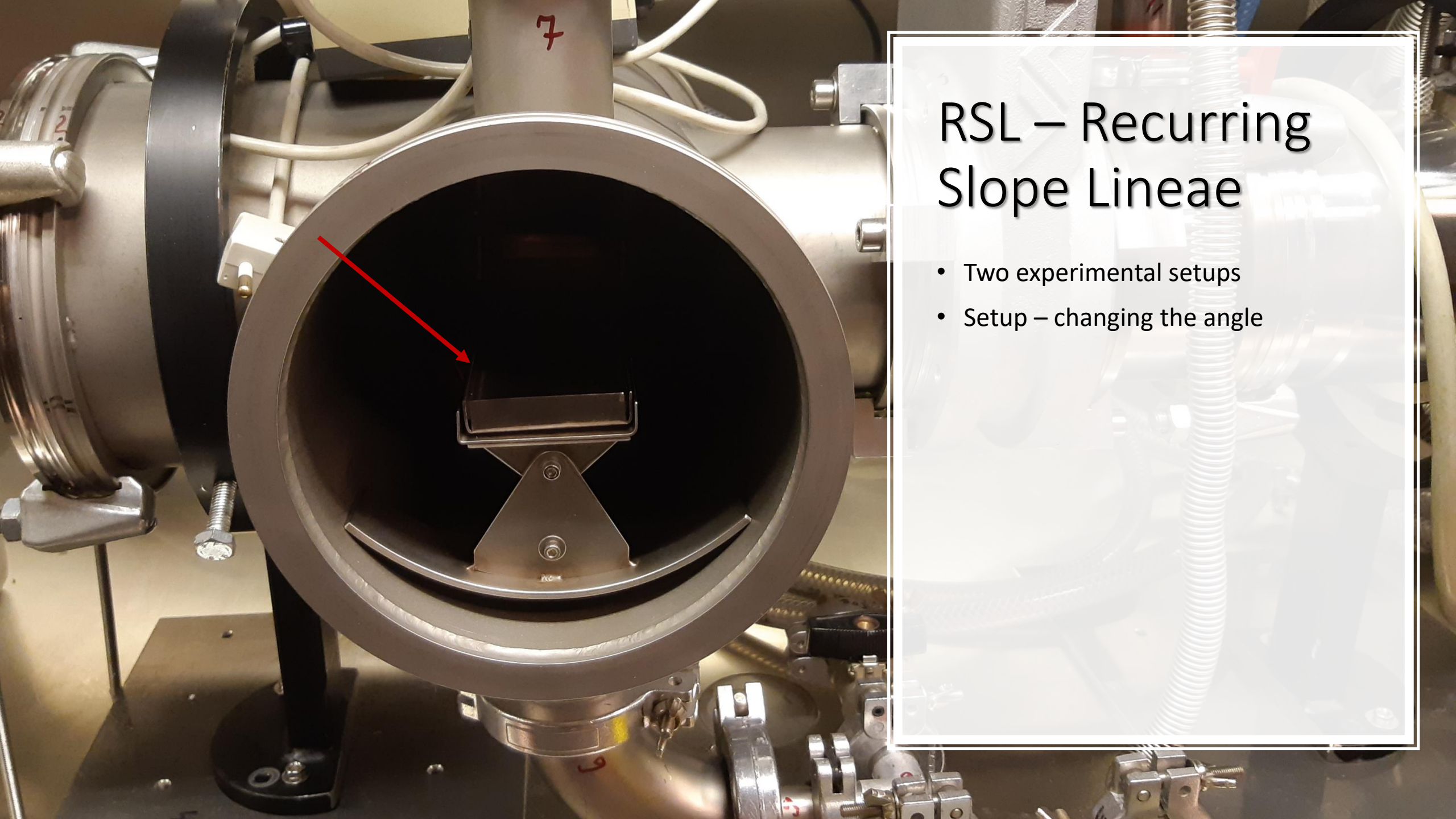


The testing of bacteria

- Temperature
- UV exposure
- Humidity
- Atmospheric composition
- Pressure

RSL – Recurring Slope Lineae

- Signs of liquid water?



RSL – Recurring Slope Lineae

- Two experimental setups
- Setup – changing the angle

Estimating the ratio of the Earth's and Mars original atmosphere

- Under the assumption that the atmosphere was created either by outgassing or collision, where objects are from either the asteroid belt or Kuiper belt.

$$Out \propto \left(\frac{r_{Earth}}{r_{Mars}}\right)^3 \qquad Col \propto \left(\frac{l_{Earth}}{l_{Mars}}\right)^2$$ Where l is the radius of the effective area.

The ratio between Earth's and Mars original atmosphere if created by outgassing – 6.64

The ratio between Earth's and Mars original atmosphere if created by collision – 3.63 (asteroid belt) and 3.54 (Kuiper belt)

The estimated Martian atmosphere

- Estimating the mass of the atmosphere today (under the assumption that it has not changed).
- Mass of Earths atmosphere $5.15 \times 10^{18}\ kg$
- Mars estimated atmosphere between $7.76 \times 10^{17}\ kg$ and $1.45 \times 10^{18}\ kg$
- The actual Martian atmosphere is around $2.5 \times 10^{16}\ kg$
- Calculating the difference and how long it would take to lose it. Loss rate $1.5\frac{kg}{s}$
- Time between 15.8 – 30.1 Ga year