



Forschungsdatenmanagement am LTT

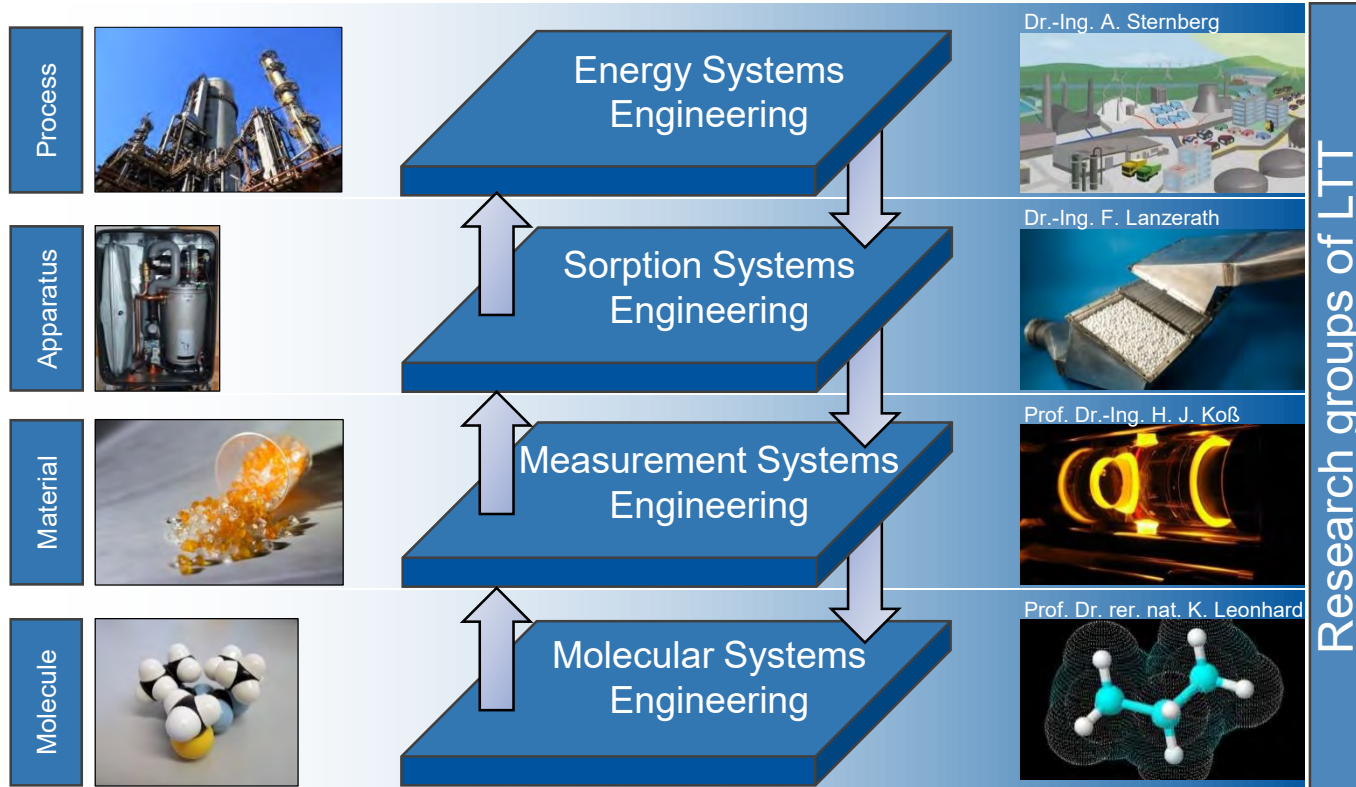
Carsten Flake

Lehrstuhl für Technische Thermodynamik

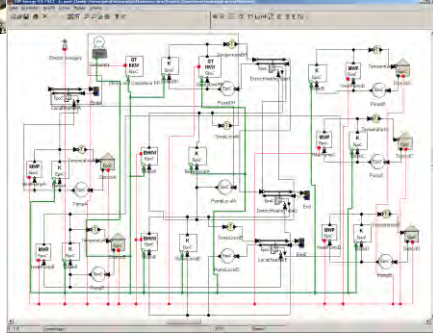
Der Lehrstuhl für Technische Thermodynamik



Arbeitsgruppen am LTT

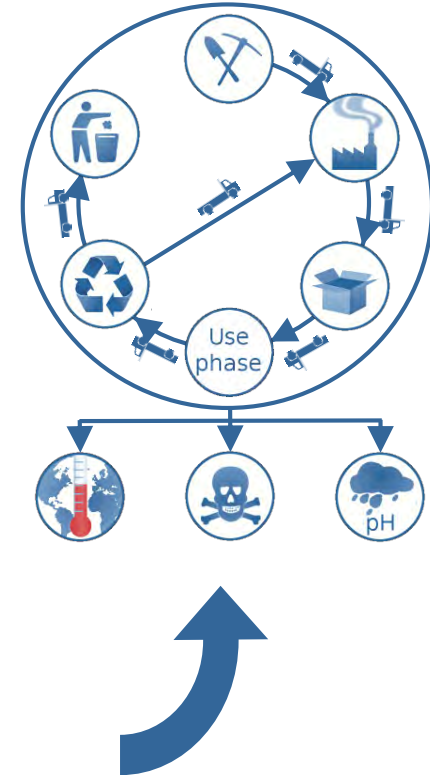
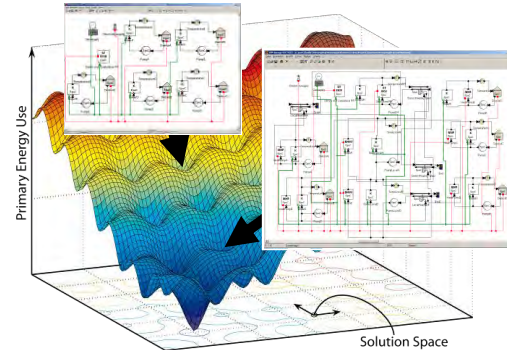


Energy Systems Engineering



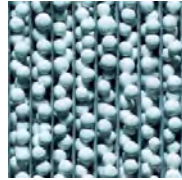
Method development

- Modeling and Simulation
- Optimization
- Life-Cycle Assessment

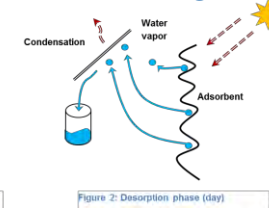
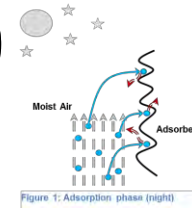


Sorption Systems Engineering

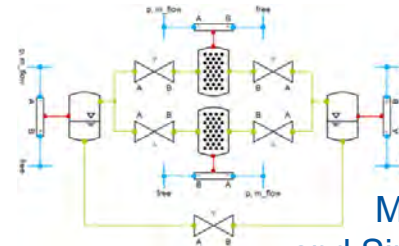
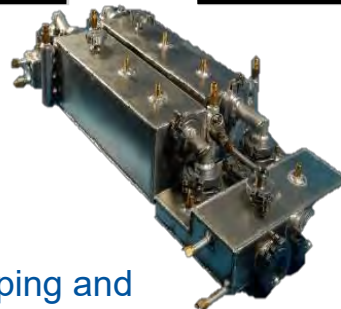
Material Development and Characterization



Conceptual Designs

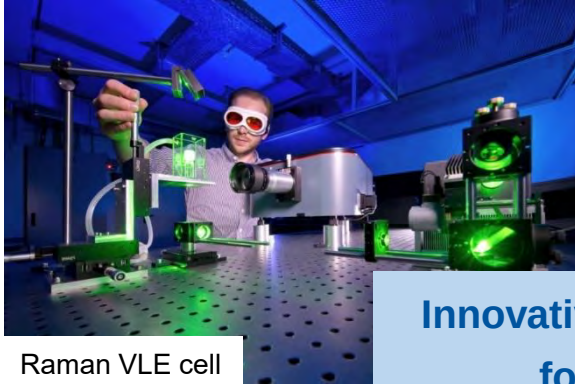


Prototyping and Test Stand Operation

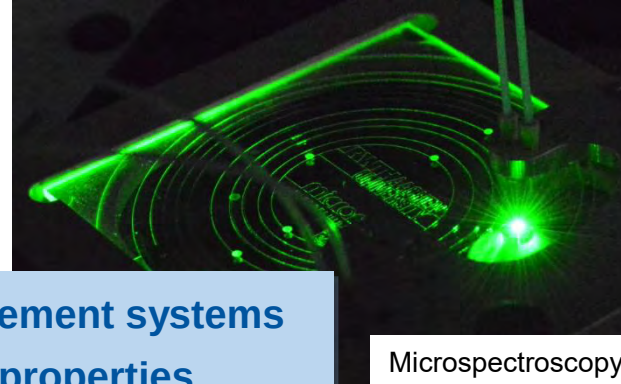


Modelling and Simulation

Measurement Systems Engineering



Raman VLE cell

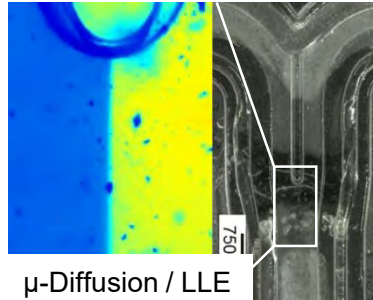


Microspectroscopy

**Innovative measurement systems
for physical properties
of complex fluids**

Methods

- Raman Spectroscopy
- Microfluidics
- Robotics
- Experimental Design



μ -Diffusion / LLE

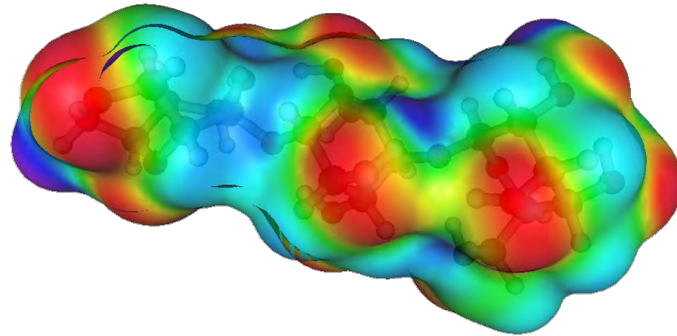
Topics

- Biofuels
- Bioreactors
- CO₂ Capture & Use
- Microgels

Molecular Systems Engineering

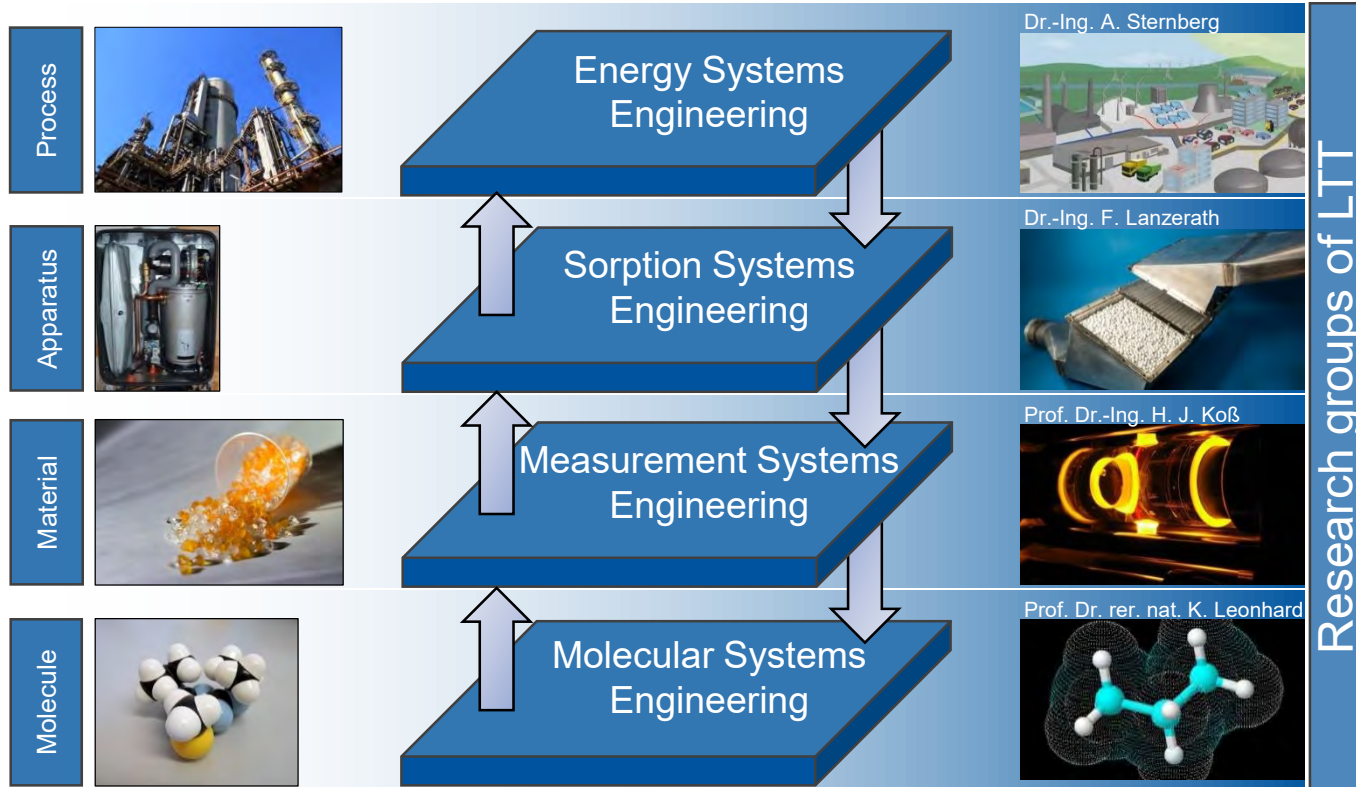
Molecular properties

- Prediction of physical properties
- Thermodynamic modelling

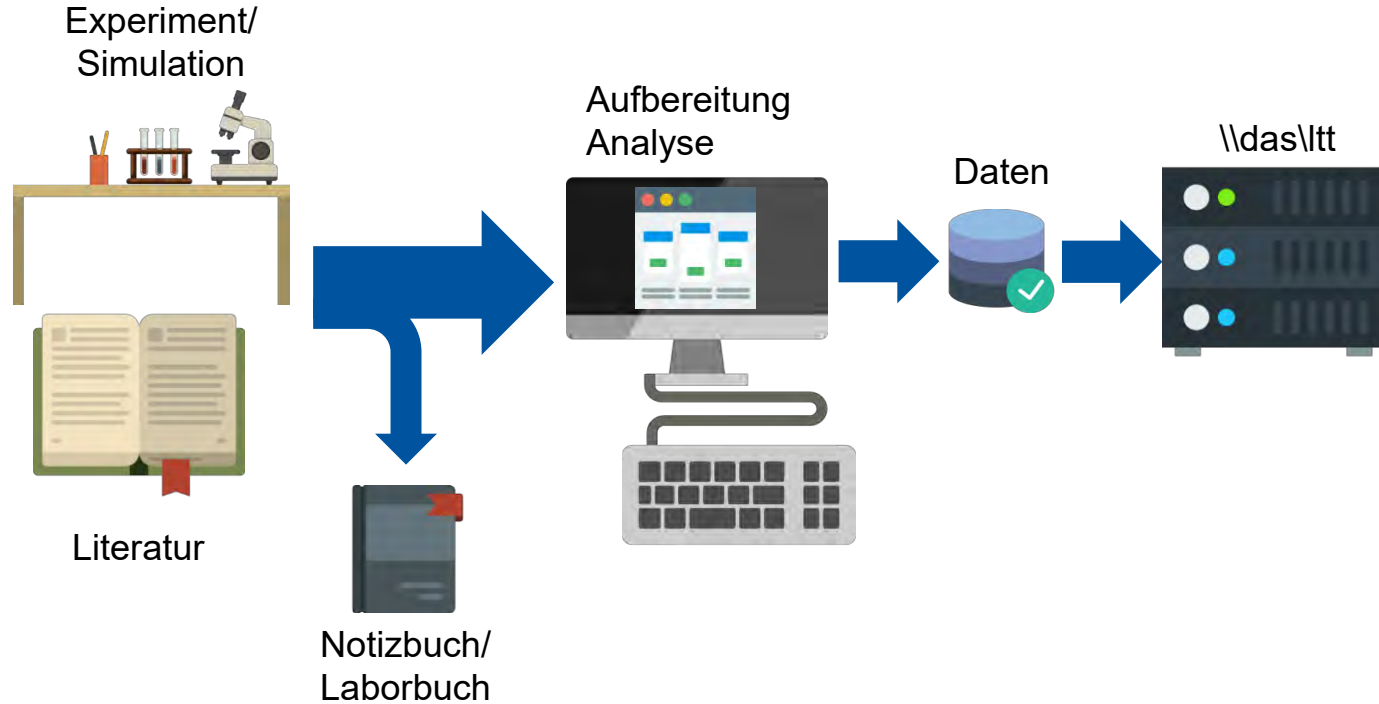


- Minimize experiments
- Process design in energy and chemical engineering

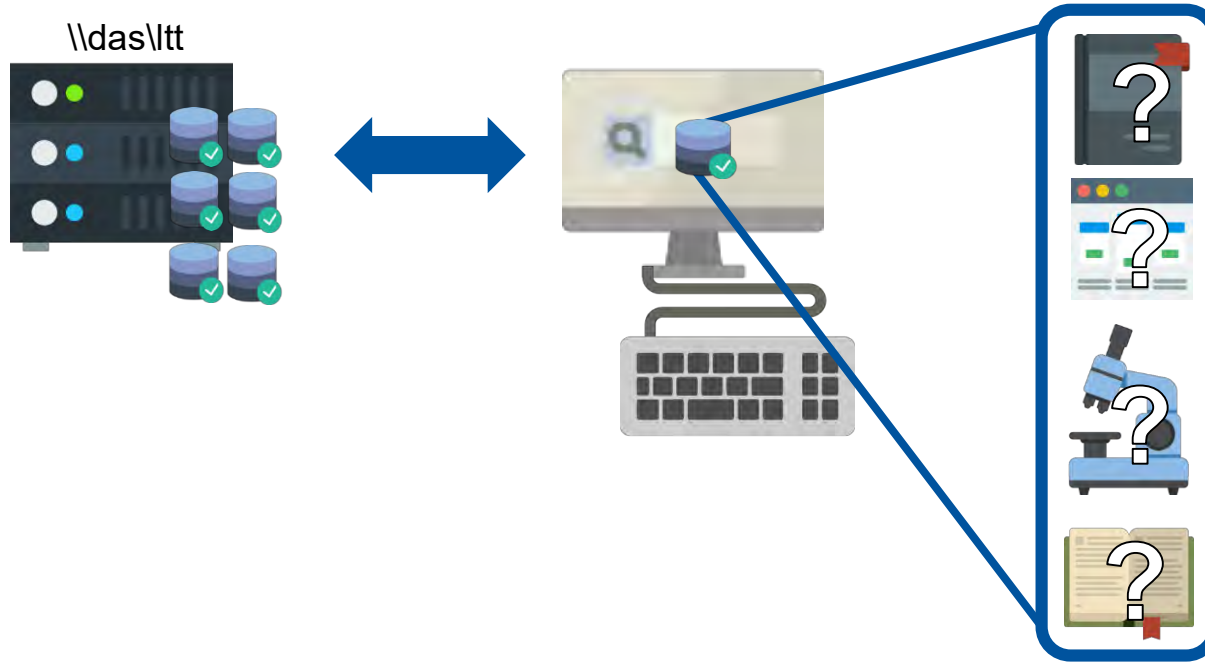
Arbeitsgruppen am LTT



Erstellung von Forschungsdaten



Notwendigkeit von Forschungsdatenmanagement

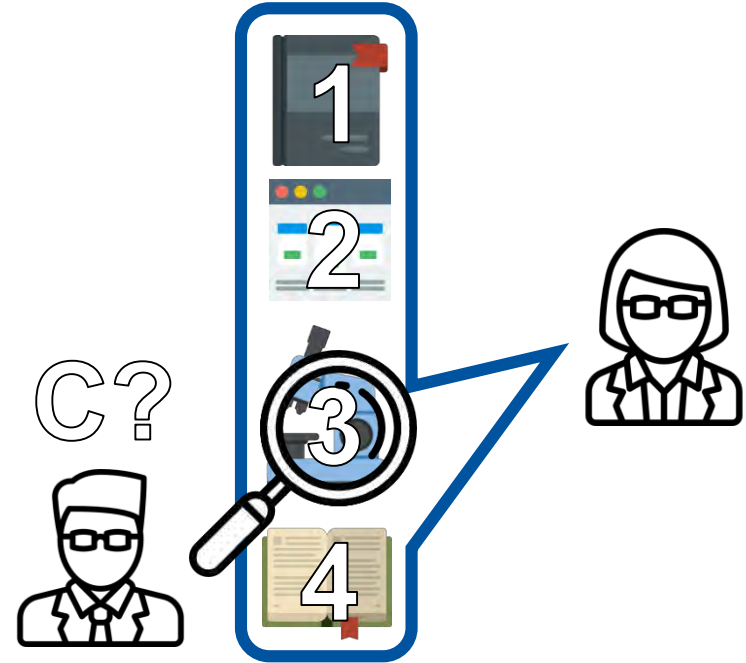


Notwendigkeit von Forschungsdatenmanagement



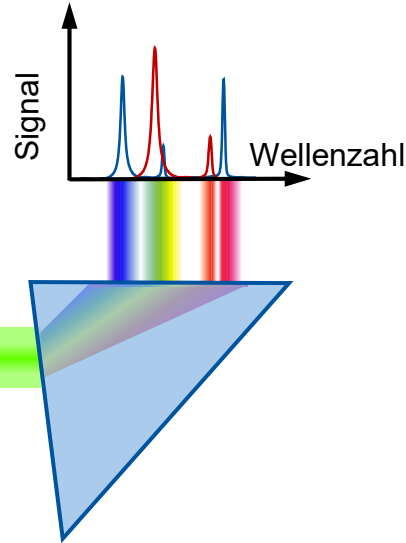
Notwendigkeit von Forschungsdatenmanagement

- Datenmanagementpläne (DMP)
- geeignete Metadatenschemata (MDS)
- Persistenten Identifikatoren (PID)



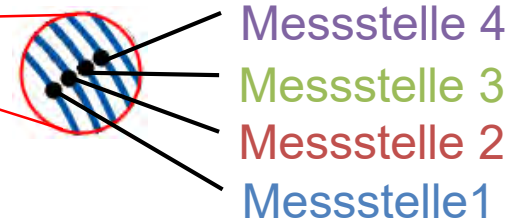
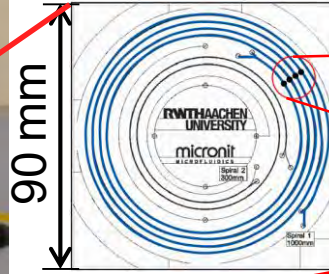
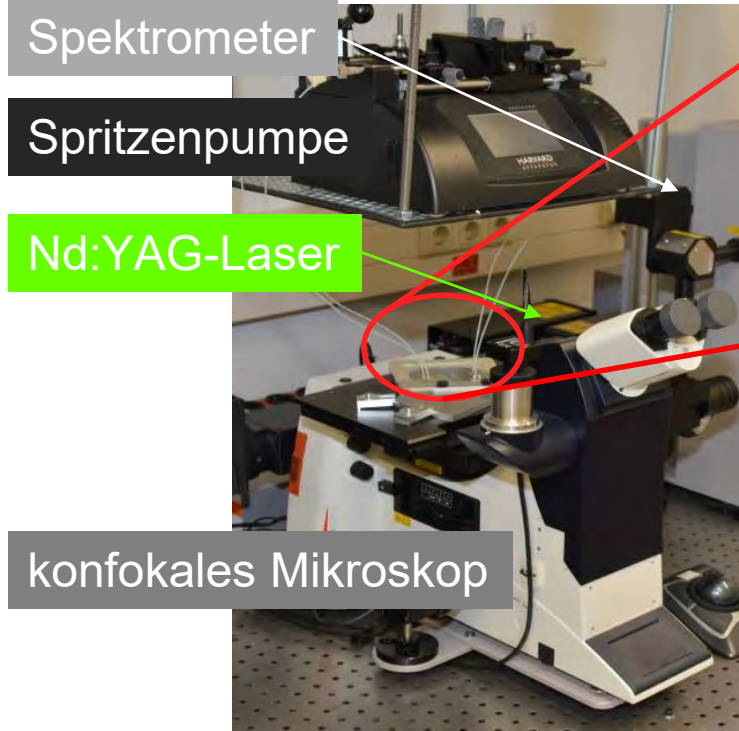
Raman-Spektroskopie

- Molekül A
- Molekül B

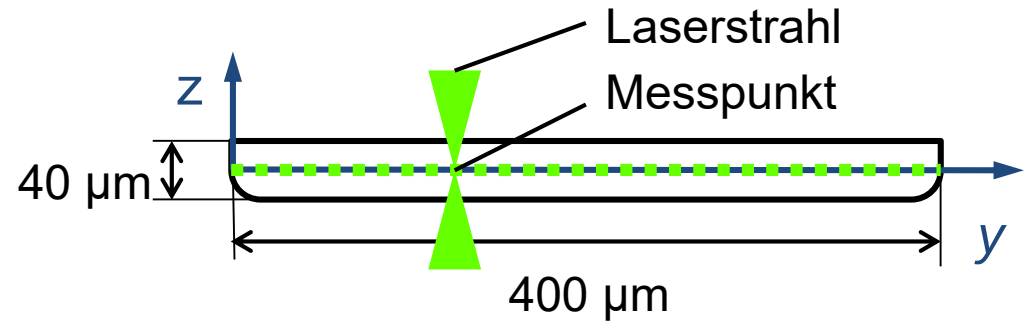


- Quantitativ:
 - $\text{Signal} \propto \# \text{ angeregte Moleküle}$
- Non-invasiv
- In-situ
- Spezienselektiv
- Niedriger Kalibrationsaufwand

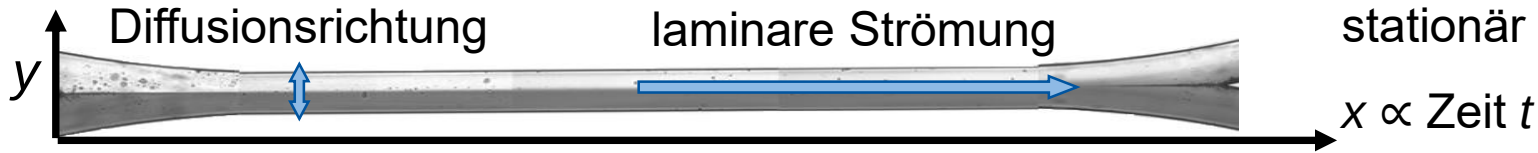
Raman-Mikrospektroskopie und Mikrofluidik



Kanalquerschnitt

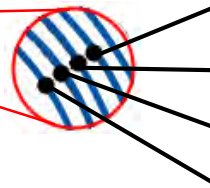
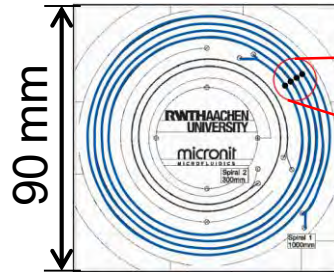


Diffusionsmessung im Mikrokanal



Mikrofluidik

- kleine Volumina
- kurze Kontaktzeiten: $t \propto \text{Diffusionslänge}^2$



Messstelle 1
Messstelle 2
Messstelle 3
Messstelle 4

Messstelle 1



Messstelle 2



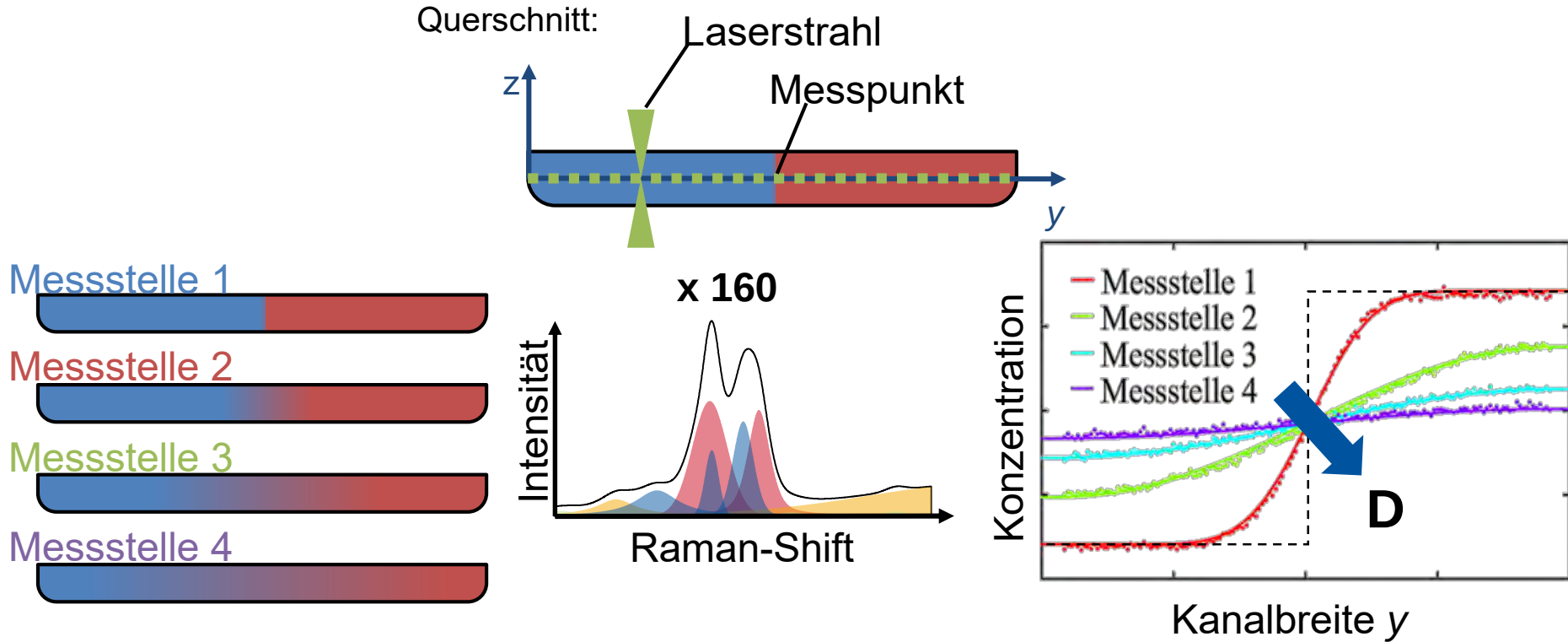
Messstelle 3



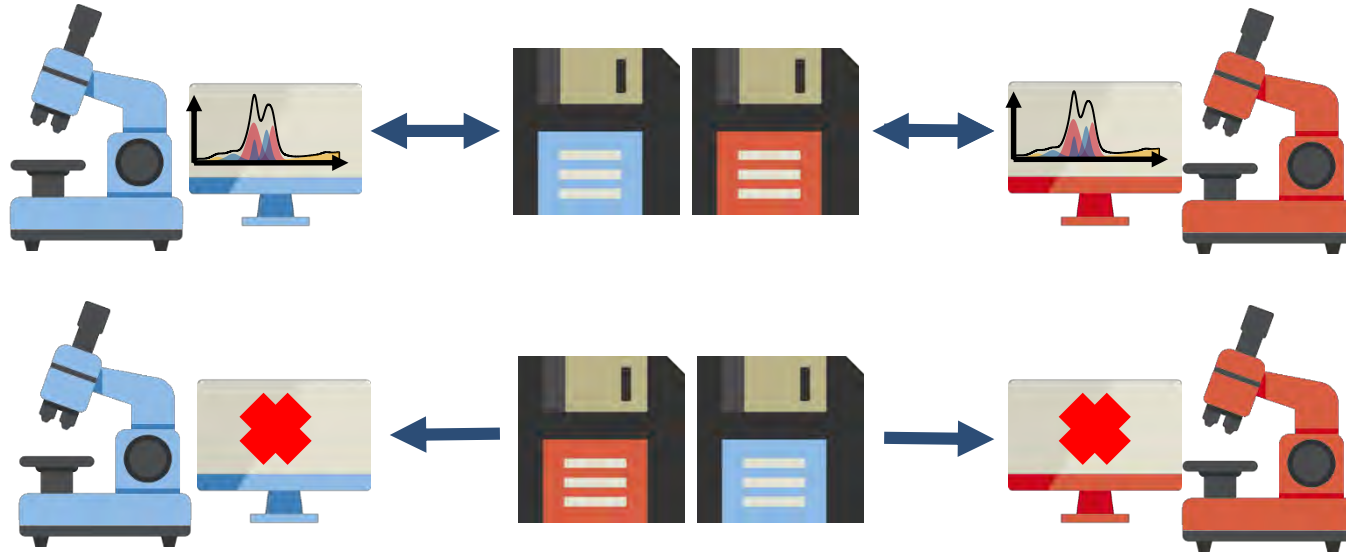
Messstelle 4



Diffusionsmessung im Mikrokanal

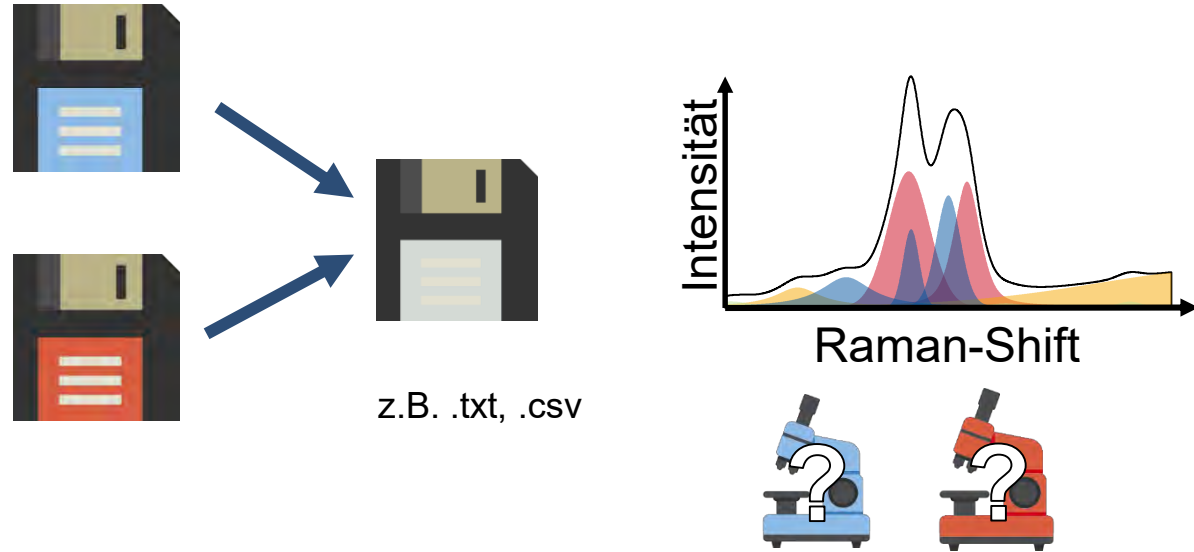


Proprietäre Datenformate



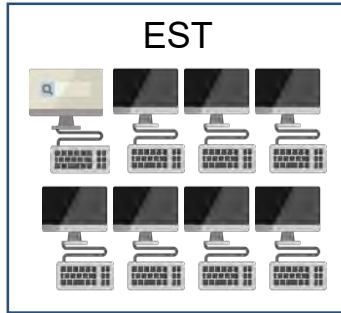
- je nach Equipment verschiedenste proprietäre Datenformate vorhanden
→ nicht langfristig nutzbar

Nutzung nicht proprietärer Datenformate

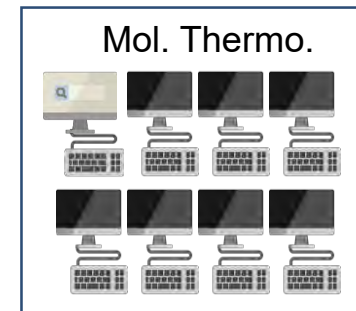
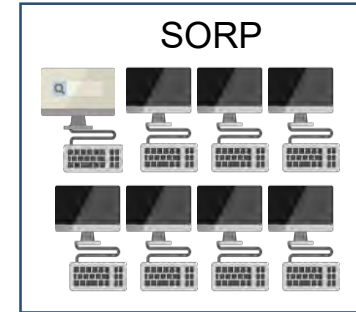


- durch Umwandlung in nicht proprietäre Datenformate können integrierte Metadaten verloren gehen

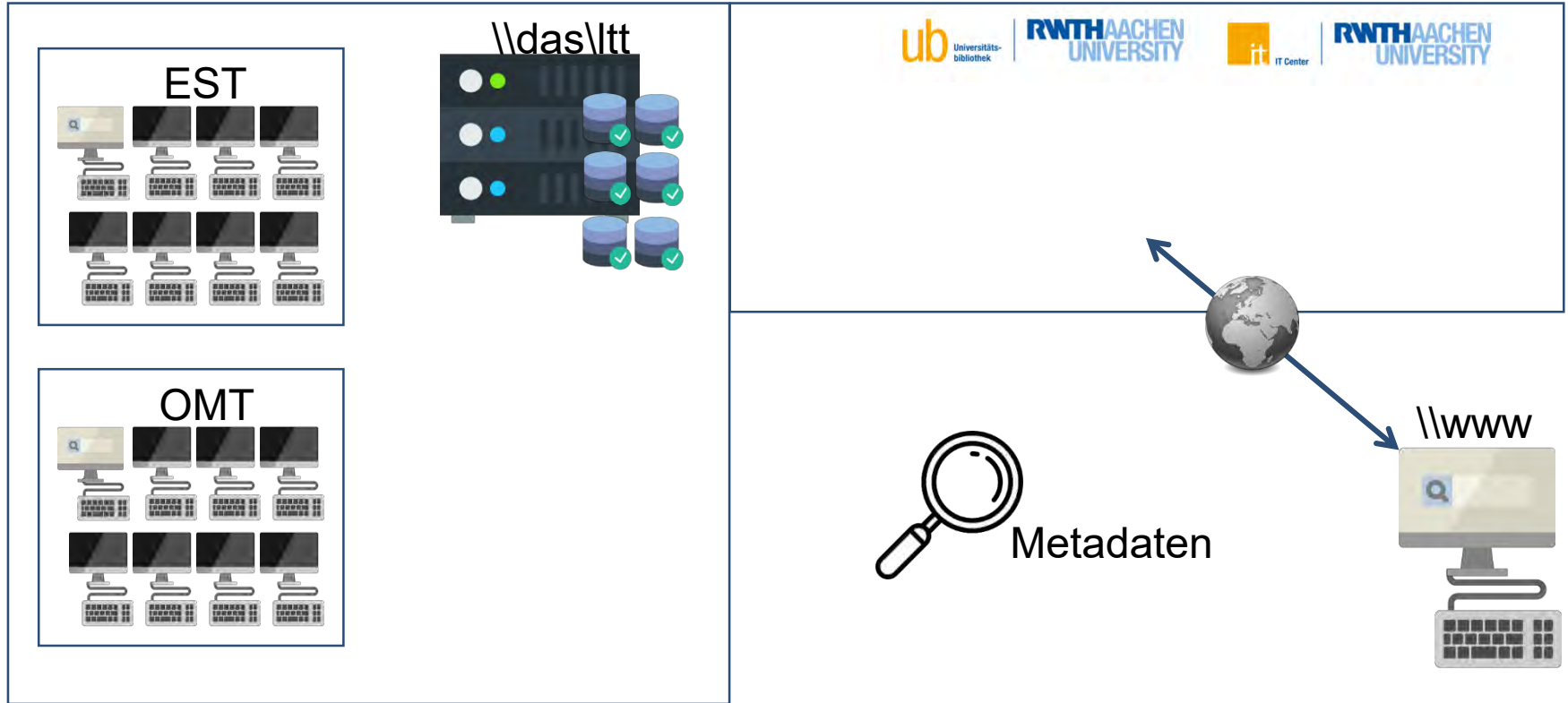
Organisation am LTT



- einheitliche Ordnerstrukturen
- festgehalten im „LTTwiki“
 - Organisation
 - Workflow
- Einführung neuer MitarbeiterInnen durch Mentorensystem



Archivieren & Publizieren



Schaffung eines am Institut einheitlichen Datenmanagements durch

- Datenmanagementpläne (DMP)
- geeignete Metadatenschemata (MDS)
- Persistenten Identifikatoren (PI)



Schaffung einer rechtlich-sicheren und von Fördergebern/Verlagen/
Kooperationspartnern akzeptierten Grundlage