



# The Metadata Cookbook

*Institute of Applied Materials*

**Nick Garabedian, Christian Greiner,  
Iliia Bagov, Karlheinz Weber**



*Institute of Materials  
Mechanics*

**Benjamin Klusemann,  
Frederic Bock**

*Institute of Metallic  
Biomaterials*

**Catriona Eschke,  
Florian Wieland**

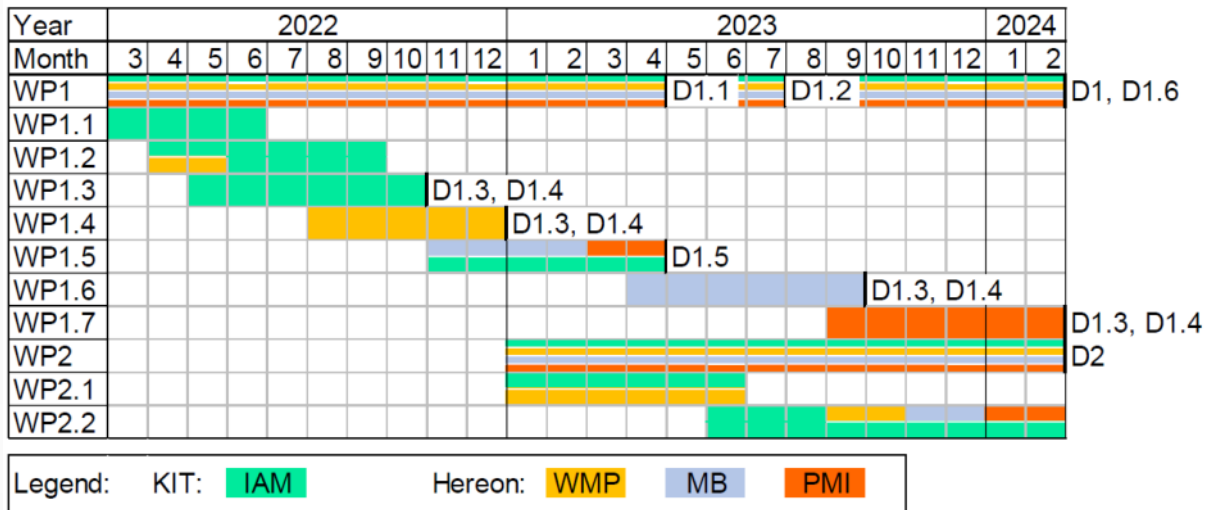
*Institute of  
Membrane Research*

**Martin Held**

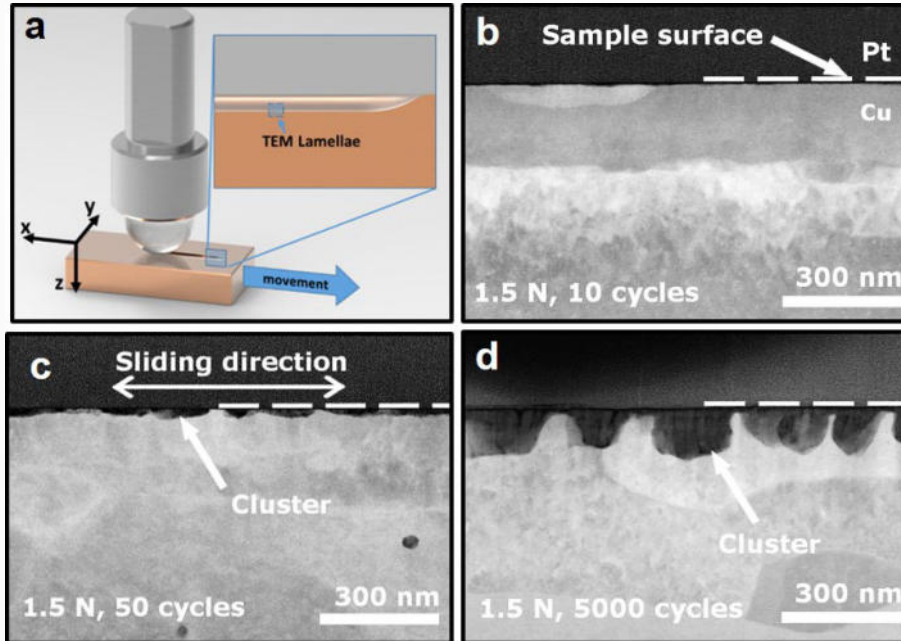


**Project Goal:** Provide an actionable **manual** of best-practices for generation of controlled vocabularies

**Timeline:**



- Nick Garabedian, Christian Greiner, Ilia Bagov, Karlheinz Weber
- **Materials Tribology** (*tribology*: the science of friction and wear)

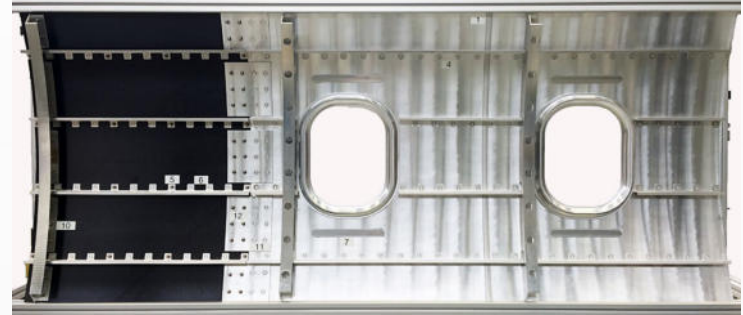


- Mechanisms of material evolution as a result of tribological loading
- Design of custom tribological tests
- Electron microscopy

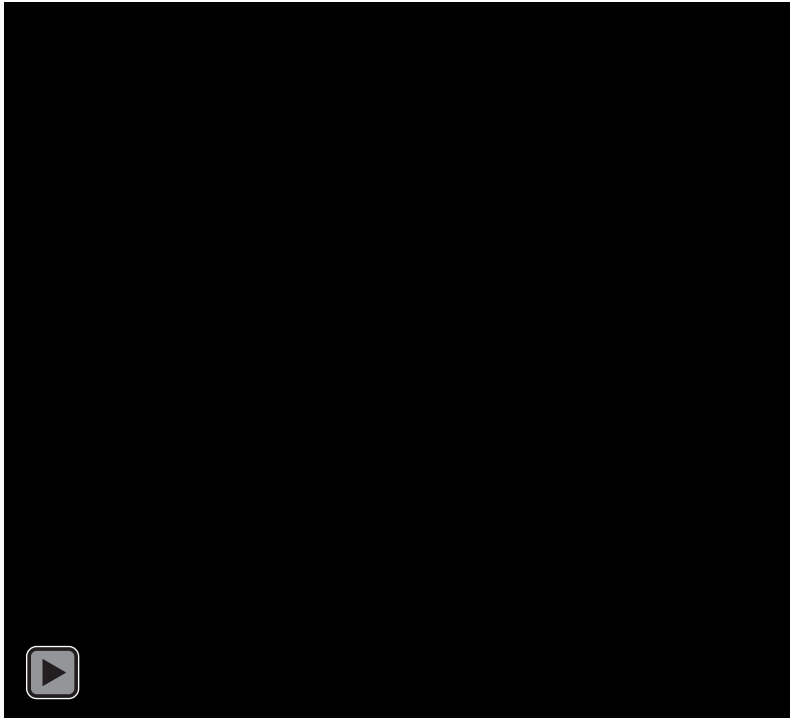
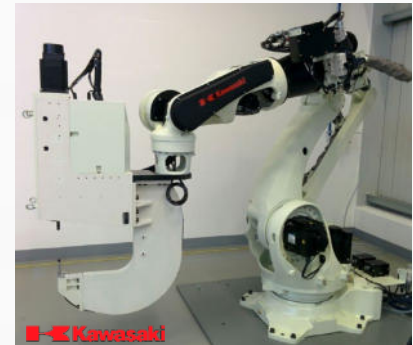
# Hereon: Institute of Materials Mechanics

- Benjamin Klusemann, Frederic Bock
- Refill Friction Stir Spot Welding

Application example:  
Stringer-skin joints in aircraft fuselage

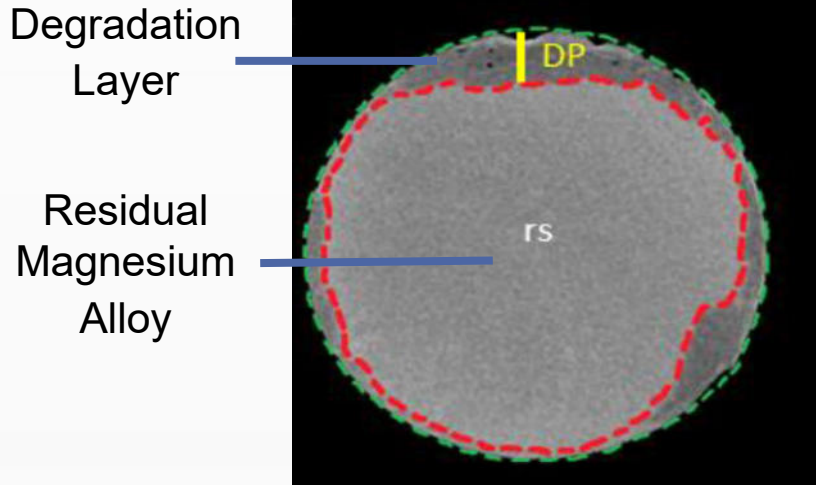


Manufacturing: Highly mobile flexible machines



# Hereon: Institute of Metallic Biomaterials

- Catriona Eschke, Florian Wieland
- **Magnesium Alloys for Biomedical Applications**

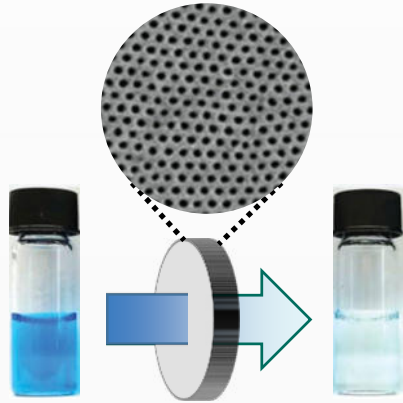


Slice of Tomographic Reconstruction  
of a Degraded Magnesium Alloy

- Magnesium is a potential candidate for biodegradable implants
- Characterization and correlation
- Uncover the mechanistic interactions for a digital twin

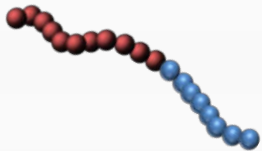
# Hereon: Membrane Research

- Martin Held
- **Polymer Membranes for Separation of Liquids and Gases**

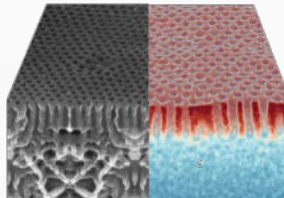


- Processing, Analytics, Modelling

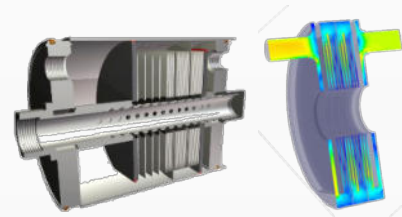
**Polymer**



**Membrane**



**Module**



**Plant**



**Project Goal:** Provide an actionable manual of best-practices for generation of controlled vocabularies

■ **MetaCook Chapter 1:**

*Deduce and disseminate the best practices for building controlled vocabularies*

■ **MetaCook Chapter 2:**

*Deduce and disseminate the best practices for transforming controlled vocabularies into formal ontologies*

■ **MetaCook Chapter 3:**

*Showcase of applying **interpretable machine learning** algorithms, which can reliably utilize data and **metadata from ELN repositories***

**How can HMC support us?**



**Thank You!**