Field Report: eLabFTW in PhoenixD

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Background and History

- Experience with paper lab notebooks during my active lab time

- No lab notebook used as senior scientist

- RDM in PhoenixD: Minor research on electronic lab notebooks

- LUH: Introduction of eLabFTW planned by LUIS

- Lage-scale equipment delivered in autumn 2021

- Test installation of eLabFTW on virtual PhoenixD server

- Larger measurement campaign in autumn 2022

- Still no eLabFTW instance from LUIS

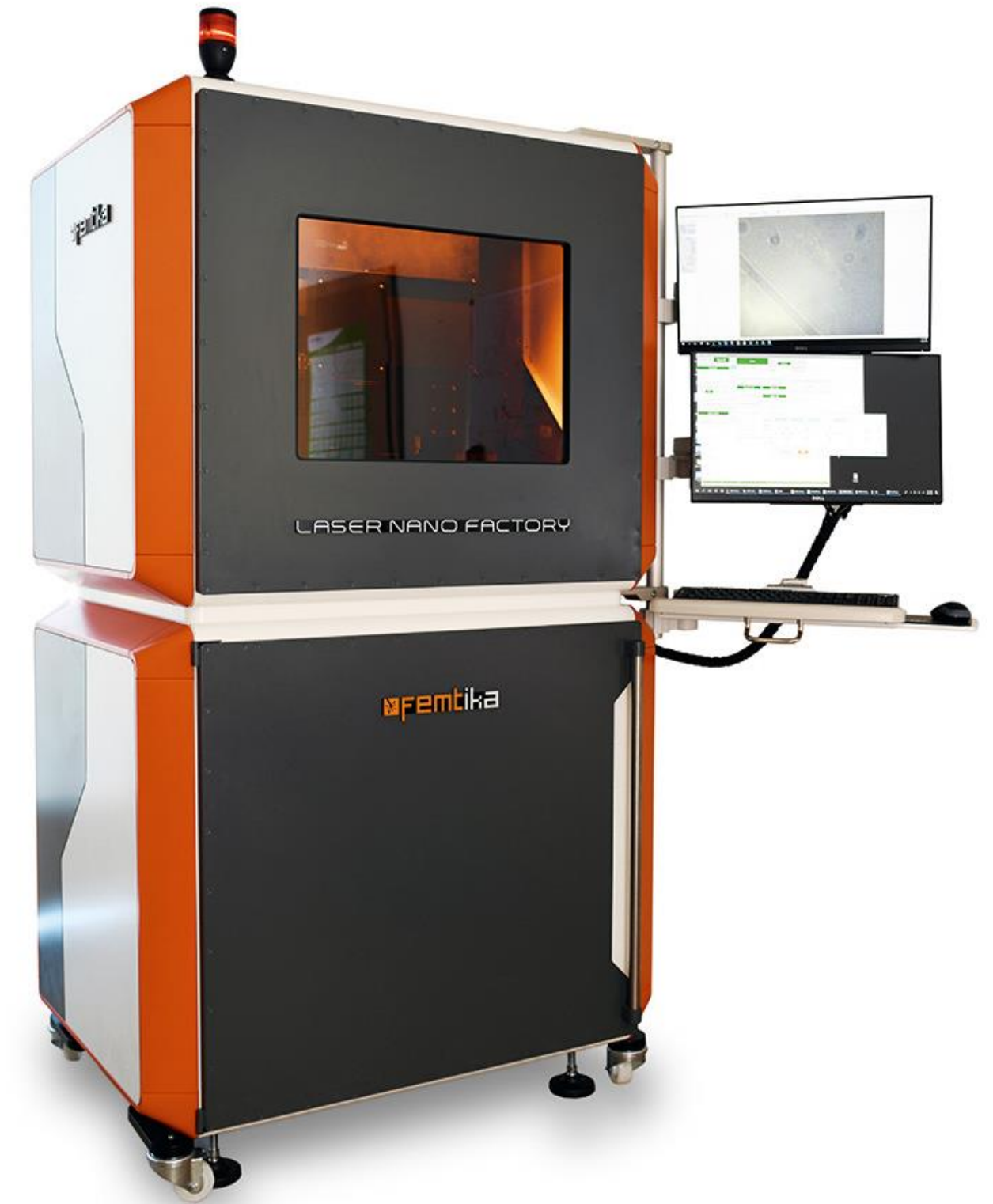- Productive PhoenixD eLabFTW instance since December 2022

PhoenixD

First Application Environment

Nano fabrication at HOT

- Nano 3D printing / material processing

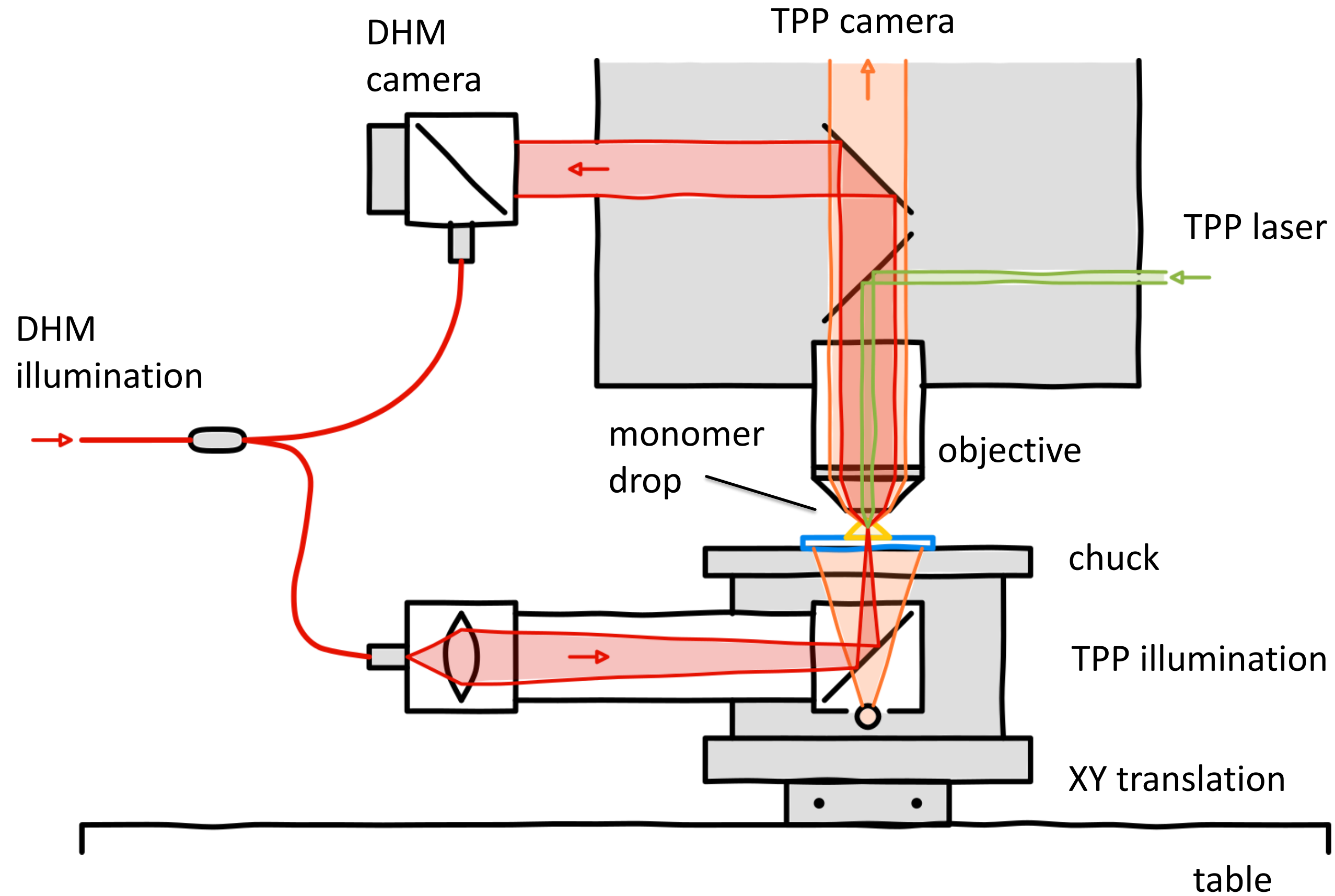- Nanolithography

- Microscopy

- Chemical activities

## Research goal

Automated fabrication with feedback loop

www.femtika.com

Femtika Laser Nanofactory

Research Tasks

- Programming the system control

- Determination of basic system parameters

- Automatic acquisition of measurement data

- Research data management

  o Measurement data (camera images)

  o Metadata: System, control, and experimental parameters

  o Storage of metadata and measurement data in new container file

- Evaluation of the measurement data
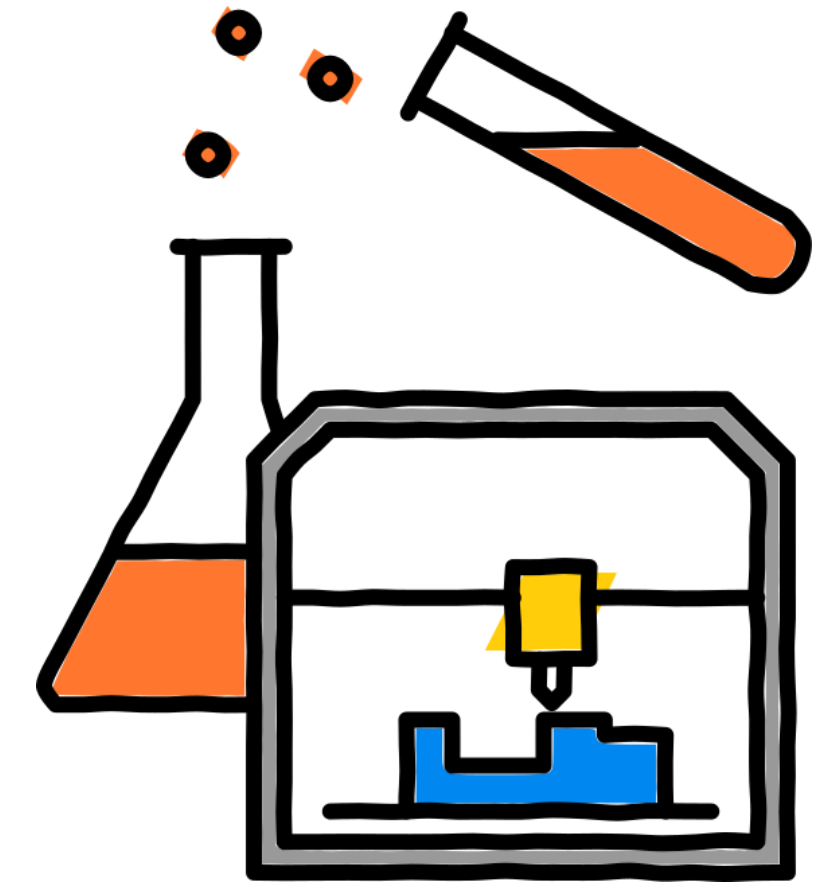
Applications of eLabFTW

- Documentation of experiments

- Documentation of the evaluation of measurement data

- Laboratory-specific instructions and recipes

- Scheduling the use of facilities

- PhoenixD user community: 3 scientists in 2021, now 18 persons

First Experiences and Conclusions

- Laboratory instructions and recipes: simple and practical

- Scheduling: simple and practical

- Team structure: not much used currently

- Requires more structured approach than paper lab notebook

  - When do I start a new worksheet?

  - Measurements and evaluations on one worksheet?

  - When do I finalize worksheets?

  - Integration of files: upload, link, ID

- Connection to control software development unclear yet

- Personal conclusion: No more paper lab notebook!

SciDataContainer

- Goal: RDM compliant data model (FAIR principles)
- Applications
  - Measurements
  - Simulations
  - Data evaluation
- Design rules for data model
  - Simple usage
  - Minimal restrictions
  - Low processing overhead
  - Lightweight implementation
  - Local and server storage (data exchange, long term, reliability)

Implementation

- Identifier: UUID

- Container format: ZIP package with certain structure

- Metadata format: JSON

- Data format: any

- Two required files:
  - content.json: description of the container
  - meta.json: description of content

- Status:
  - Documentation: complete (https://scidatacontainer.readthedocs.io)
  - Python implementation: complete
  - Server implementation: usable beta
  - GUI implementation: ongoing

Conclusions

Lessons learned

- Central server instance is required
- Electronic lab notebook requires structural adaption
- Should be mandatory for new students
- Combination with RDM recommended
- Definitely worth the effort