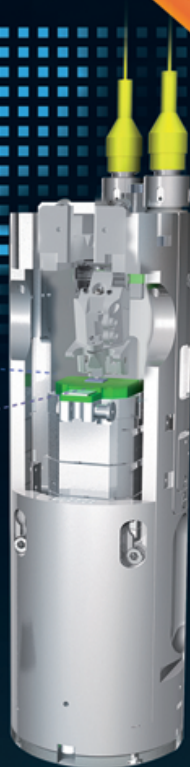
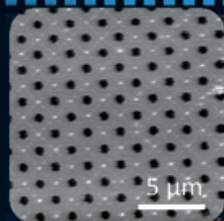


Tired of  
helium costs?

# attoDRY LAB

Cool down. Measure. Publish.



## The World's First Cryogenic Closed Loop Scanning Probe Microscopes

- Scan range up to **125 µm x 125 µm @ 4 K**
- Interferometric **sensor resolution < 1 nm**
- **No piezo hysteresis, perfectly linear images**
- Available for  
attoAFM/MFM I (cantilever based), attoAFM III (tuning-fork based), attoSHPM,  
attoCFM I (free-beam based), attoCFM II (fiber-based)
- Compatible with ultra low temperatures (10 mK..300 K) and high magnetic fields (0..12 T)
- **NEW:** attoAFM I+ head feat. alignment-free  
cantilever holder: tip exchange in < 2 min.
- **NEW:** quick exchange sample holder incl. 8 electrical contacts



### attoDRY2100

toploading, dry low vibration cryostat

- **Base temperature 1.5 K**
- Fully automated gas handling and temperature control 1.5 K – 300 K
- Superconducting 9 T magnet (others on request)



Temp. range

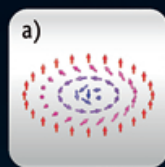


9 T magnet

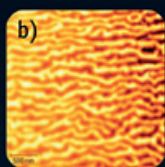


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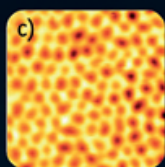
# Selected Applications



a)



b)



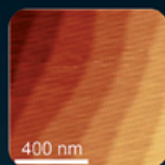
c)

1. Skyrmions / helimagnetic phase imaged with attoMFM in attoDRY1000

- a) Schematics of spin arrangement in a single skyrmion.
- b) MFM image of the helimagnetic phase of  $\text{Fe}_{0.5}\text{Co}_{0.5}\text{Si}$ \*. The measurement was carried out at 3.2 K under zero magnetic field.
- c) MFM image of the skyrmion phase of  $\text{Fe}_{0.5}\text{Co}_{0.5}\text{Si}$  (scan size is  $1.5\text{ }\mu\text{m} \times 1.5\text{ }\mu\text{m}$ ). The sample was first cooled down from 60 K under 15 mT magnetic field to 3.4 K.

2. Atomic steps measured in dry cryostat

The exceptionally low vibrations of our toploading dry cryostat attoDRY1000/1100 allow even for imaging atomic steps - in this case on  $\text{SrTiO}_3$ -, experimentally proving that this dry system approaches the performance of liquid cryostats.



400 nm

(attocube application labs 2013)



Technische Universität München

\*Sample courtesy of A. Bauer and C. Pfleiderer, Technical University of Munich, Garching, Germany  
Thanks also to J. Seidel, University of New South Wales, Sydney, Australia for fruitful discussions



UNSW

## attoDRY LAB

Cool down. Measure. Publish.



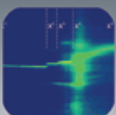
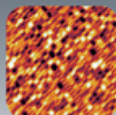
Magnetic Imaging



Confocal Microscopy



Transport Measurements



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