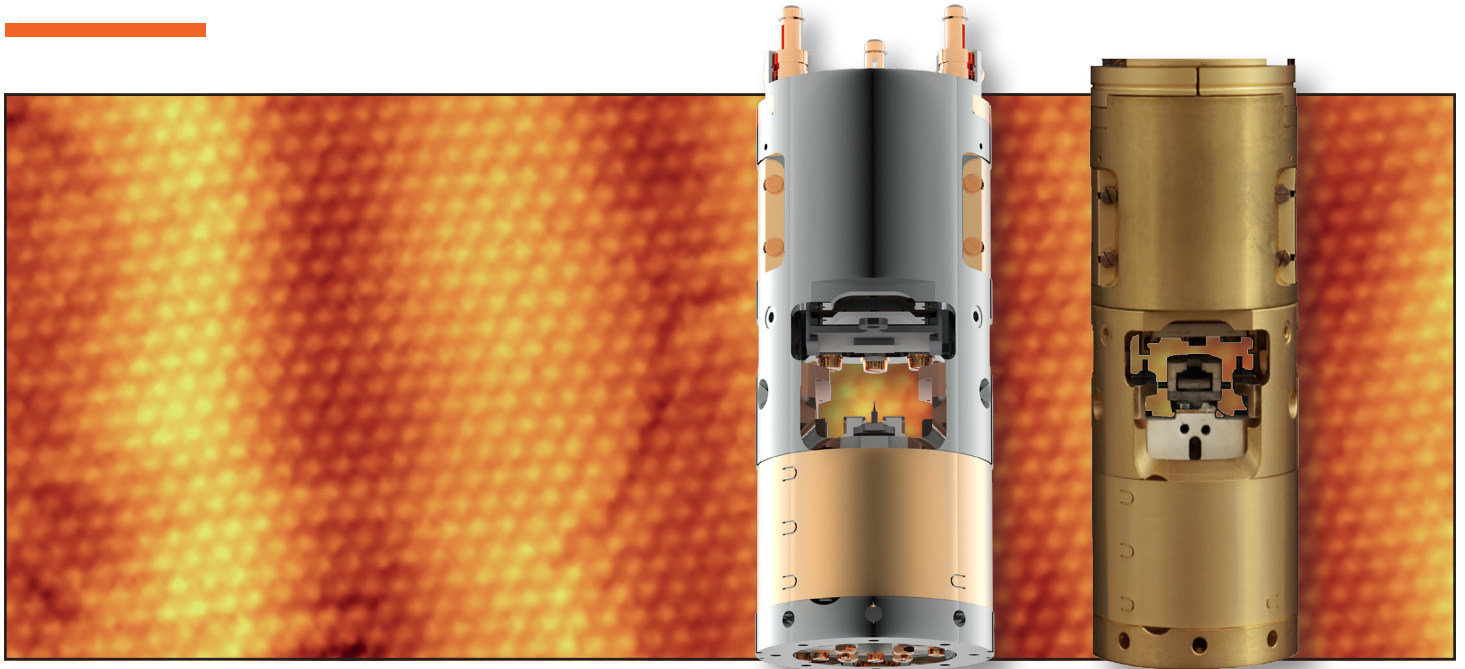


TRIBUS SPM Compact UHV Head



- STM, AFM & Spectroscopy
- Excellent Stability
- Orthogonal 3D Coarse Motion
- Independent Tip & Sample Exchange
- Easy Handling
- Low Temperature Compatibility
- Non-magnetic Design

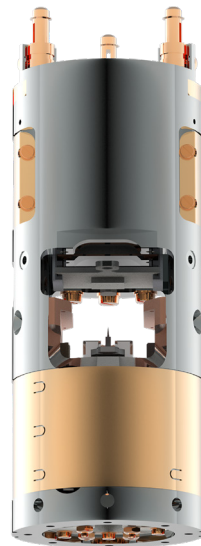
The TRIBUS SPM

The ultra-compact TRIBUS is an SPM head for a wide variety of applications. Whether for SPM-spectroscopy, surface imaging, or manipulation of nanoparticles, for experiments at elevated temperatures, or at the millikelvin scale, in high magnetic fields or in spatially tight environments, the TRIBUS head is the ideal solution when highest resolution, accuracy and flexibility are required.

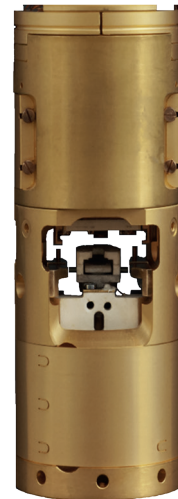
Integration into almost every UHV environment is possible due to its small footprint, non-magnetic materials, and compatibility with a wide temperature range.

Special attention was paid to the selection and pre-characterisation of materials for the TRIBUS head. As a result, it has a minimal thermal drift and optimum stiffness, which yields excellent stability in the SPM.

Aspects such as 3D coarse motors with independent and orthogonal axes, and easy and safe in-situ tip and sample exchange, facilitate ease of daily work. Additional features such as multiple electrical sample contacts and optical access ports extend the possible applications beyond standard SPM measurements.



TRIBUS

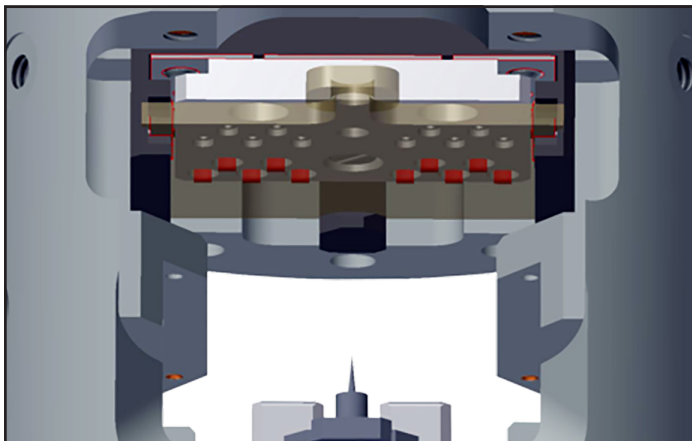


TRIBUS Ultra

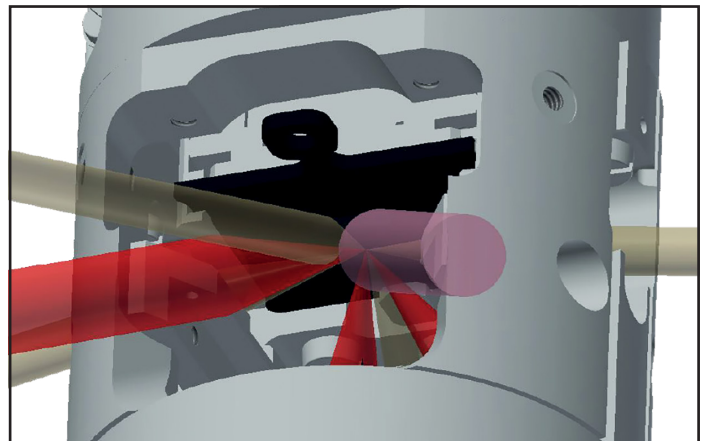


Customised TRIBUS Ultra

There are two variants of the TRIBUS SPM: TRIBUS Ultra for temperatures down to mK range and high magnetic fields (> 2 T), and TRIBUS for temperatures above 1.1 K and magnetic fields of < 2 T.



In addition to the standard sample contact, the sample acceptor stage carries up to 10 electrical contacts (shown in red).



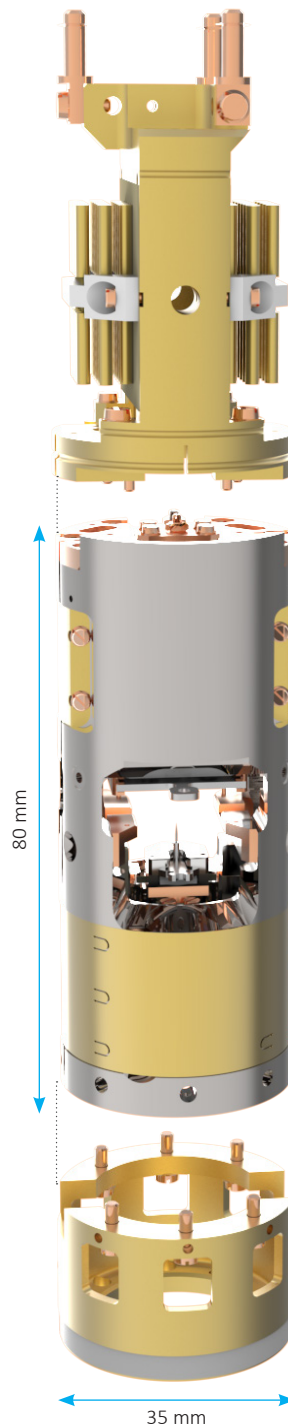
Multiple access ports for in-situ evaporation, optical observation/illumination, and in-situ tip and sample exchange.

The Compact UHV SPM Head

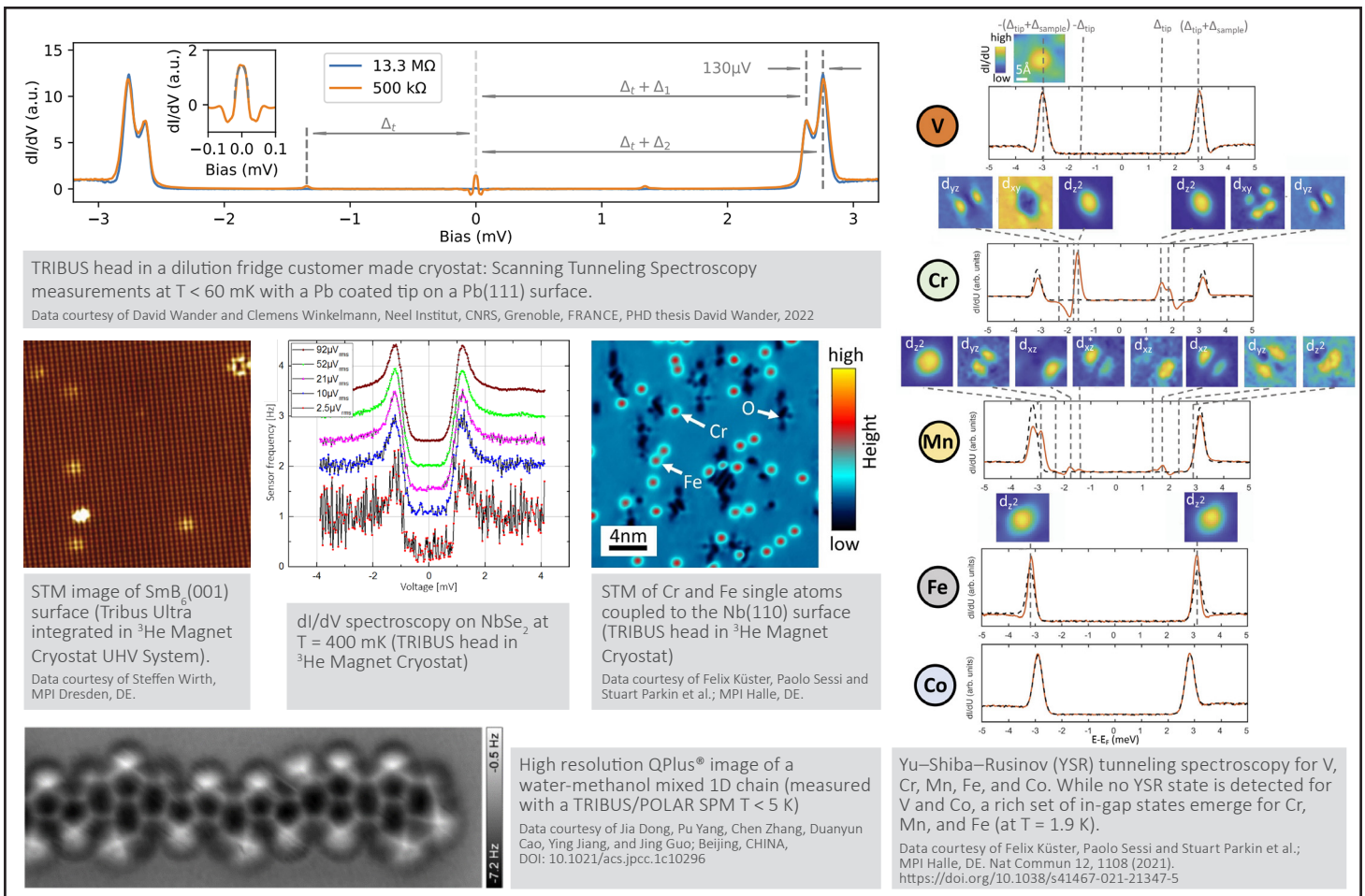
Adapter for spring suspension and/or connector terminal; optional according to experimental requirements.

- SPM Measurement Head
 Compact footprint: h = 80 mm and $\varnothing = 35$ mm.
- Piezo tube scanner (scanning tip)
 - 3D coarse positioning:
 - 2D horizontal sample movement
 - Vertical movement of tip and scanner
 - Tip and sample at same temperature
 - Excellent signal shielding

Optional second adapter for integration of heater and/or touch control detectors.



Standard sample plate (various materials available).	Cost effective metal tip carriers (consumable); various materials available.	Sample plate with multiple electrical contacts.	Direct current sample plate e.g. for Si sample preparation.	QPlus® AFM sensors. More sample plates, sensors, and carriers are available. Please ask for further details.



Technical Data

TRIBUS SPM head characteristics:

- 3D piezo-driven coarse positioning motor with a range of 4 mm x 4 mm x 10 mm (XYZ)
 - Horizontal sample movement: 4 mm x 4 mm
 - Vertical tip movement: 10 mm
- Scan range
 - Scan range depends on temperature
 - approx. $10 \mu\text{m} \times 10 \mu\text{m} \times 1.8 \mu\text{m}$ at $T = 300$ K
 - by a factor of 5.5 smaller at $T < 5$ K (LHe)
- Orientation of tip and sample
 - Sample surface facing downwards (allowing direct in-situ evaporation from a - crucible onto cold sample in STM)
 - Tip pointing upwards
- Independent tip and sample exchange (for sample with height < 3 mm)
- Proven compatibility with magnetic fields of up to 12 Tesla and with low temperatures of down to 60 mK
- Max. baking temperature: 150 °C
- Dimensions of the ultra-compact SPM head (excluding adapters): approx. 35 mm (dia) x 80 mm (h)

SPM Measurement Modes:

- STM, STS, I(V), dI/dV, dI/dz
- IETS
- Spin-polarised STM and STS
- QPlus® AFM, df(z), df(U)
- Atom, molecule and nanoparticle manipulation

Options:

- QPlus® AFM operation
- 4 or 10 additional sample contacts
- STM tip preparation tool

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