maXs: Micro-calorimeter Arrays for High **Resolution X-Ray Spectroscopy in Atomic Physics**

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Cryogenic microcalorimeters combine the advantages of many of the currently used detectors for spectroscopy applications:

- Energy resolution up to a few eV (1.6 eV @ 6 keV [1], E independent)
- Applications between XUV and hard x-rays (100 eV 100 keV)
- Pixelated detector surface(currently 64 pixel [2], several 1000 planned)
- Low background and high efficiency (ideal for low event rates)

 \Rightarrow Ideal detectors for x-ray spectroscopy

Metallic Magnetic Micro-Calorimeters (MMCs) are energy dispersive particle detectors operated at temperatures below 50 mK, which use a paramagnetic temperature sensor to convert the temperature upon the absorption of a single x-ray photon (or particle) into a change of magnetic flux within a superconducting meander. The magnetic flux is coupled into a highly sensitive detector, called **S**uperconducting **Q**uantum Interference **D**evice (SQUID), where it causes a change in electrical current flow. Finally, a chain of SQUIDs is used to amplify the signal. Arrays of MMC sensors organized in sets of two can be placed onto a single chip forming pixelated detectors like the *maXs-detectors*.





placed in front of an EBIT [3].



X-rays from electronic processes in the ions can be observed.





