

# Research infrastructure

SNSB scientists use numerous methods and techniques for their research, including molecular phylogeny and taxonomy, DNA barcoding, DScan digitization,  $\mu$ CT and digital X-ray, 3D laser scanning, 3D reconstruction, morphometrics, ultrastructural research, Raman spectroscopy, and isotopic analysis.

## **Bavarian State Collection for Palaeontology and Geology**

### **SNSB**

- 3D reconstruction (Amira, VGStudio MAX)
- Special libraries paleontology (Paläozoologie und -botanik)
- Rock, slurry and acid preparation laboratories (e.g. micropaleontology)
- High-resolution 4K digital microscopy incl. fluorescence and 3D reconstruction (Keyence VHX 5000, 7000)
- Scanning electron microscopy (desktop-REM Phenom XL G2; high and low vacuum) incl. energy dispersive X-ray spectroscopy (EDX) and secondary electron detector (SED) for element analysis; sputter coating for deposition
- High-resolution digitization (book2net) of archive and collection objects (A2 size, up to 10 cm thickness)

### **LMU – cooperation „Münchner Modell“**

- Geomicrobiology laboratory
- Research aquaria (seawater)
- S1 Molecular laboratories (130 sqm, 23 workstations)
- Rotor-Gene qPCR
- Fluorescence microscopes and stereomicroscopes
- Genomics Lab
- Illumina MiniSeq (Next Generation Sequencing)
- High-Performance Computing Infrastructure: Linux Cluster

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## **Bavarian State Collection for Botany**

### **SNSB**

- Various light microscopes and stereo microscopes, stacking microscope
- Cameras/digitization: 1 HerbScan, 1 mounted camera (incl. accessories, illumination, etc.), 1 PhaseOne for digitization of specimens up to 2 cm thickness.
- The molecular biology laboratory of BSM is a registered S1 laboratory: Genetically modified organisms can be used here by expert staff. There is a PCR and a qPCR device and an Eppendorf refrigerated centrifuge 5810R.
- SNSB-IT Center

## **LMU – cooperation „Münchner Modell“**

- REM (incl. sputtercoater (gold, platinum, carbon), low vacuum use in SEM possible)
  - FISH laboratory, S1 lab, genomics lab, histology lab
  - various microscopes (incl. fluorescence; reflected light, digital microscope)
  - Climatic chambers and climatic cabinets
  - Special library
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## **Botanical Garden Munich-Nymphenburg**

- Special library
  - Experimental greenhouse
  - SiMa Bank (collection of plant samples dried in silica gel for research purposes)
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## **Bavarian State Collection for Mineralogy**

### **SNSB**

- Raman spectroscopy (with light microscopic spatial resolution, non-destructive analysis of organic and anorganic substances).
- FTIR spectroscopy (infrared spectroscopy for the identification of organic or anorganic substances, mobile instrument)
- High-resolution digital light microscopy for 3-D reconstruction (Keyence)
- Polarization microscopy in transmitted and reflected light

### **LMU – cooperation „Münchner Modell“**

- X-ray diffraction (polycrystals/powders in reflection and transmission, single crystals)
  - Analytical FE scanning electron microscopy (1 nm image resolution, elemental analysis with EDX, phase and microstructure analysis with EBSD, KL, STEM)
  - Mössbauer spectrometry
  - Electron-Probe-Micro-Analyser (precise element analysis in the 1 micrometer range)
  - further analytical methods
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## **Bavarian State Collection for Anthropology**

### **SNSB**

- Laboratory for sample preparation of stable isotopes (expected to be completed in 2022)

- Osteological reference series “Winthir collection” comprising over 200 individuals

## **Bavarian State Collection for Palaeoanatomy**

### **SNSB**

- 3D scanner for small and large objects

### **LMU – cooperation „Münchner Modell“**

- Ancient DNA laboratory
  - Special libraries paleoanatomy
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## **Bavarian State Collection for Zoology**

### **SNSB**

- Histology laboratory
- X-ray analysis and micro-computer tomography (3D)
- 3D reconstruction (Amira, VGStudio MAX)
- S1 Molecular laboratories
- Preparation for Next Generation Sequencing
- Collection digitization
- High-resolution macro- and microphotography
- Special library zoological systematics

### **LMU – Kooperation „Münchner Modell“**

- Light optical and electron microscopic surface and section analysis:  
High quality light optics, SEM, TEM
  - Next Generation Sequencing
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## **RiesCraterMuseum Nördlingen**

### **SNSB**

- Isotope analysis of heavy elements
- Microscopes/rock saws