

Elisabeth Müller, PhD

Name: Müller Gubler
First names: Elisabeth Agnes



CURRENT POSITION

Operational manager of the Electron Microscopy Facility at PSI

PROFESSIONAL EXPERIENCE

Since 2013 Operational manager of Electron Microscopy Facility at PSI
2007-2013 Staff member at Electron Microscopy Center at ETHZ (EMEZ)
2004-2006 TEM specialist for the Solid State Physics Laboratory (30% position)
1996-2006 Senior researcher at Laboratory for Micro- and Nanotechnology at PSI
(50% position)
1992-1996 Postdoctoral Fellow, Solid State Physics ETH Zürich

EDUCATION

1992 PhD in Physics, ETH Zürich, Switzerland (Prof. H.-R. Ott)
1988 Diploma in Physics, ETH Zürich, Switzerland

MORE DETAILED DESCRIPTION OF PROFESSIONAL EXPERTISE

1988-2006 (PhD, Postdoc, employment at LMN/PSI and at Solid State Physics/ETH)

While during my time as a PhD and Postdoc doing *research* had of course highest priority, I already started regularly investigating samples of colleagues while working as a PhD student in physics at ETHZ. This substantially broadened my knowledge with respect to analyzing different materials with EM. During my subsequent employment at LMN/PSI and later at the Solid State Physics Laboratory (ETHZ), *collaboration and service* related aspects became major aspects of my work. While doing research and quality control on a large number of SiGe and SiGeC materials at the LMN group (D. Grützmacher), I was in addition confronted with various types of materials (semiconductors, superconductors, oxides and some metals) and very different scientific questions at my additional employment at the Solid State Physics Laboratory at the ETH. The latter projects were in collaboration with many different researchers in physics, materials science and also the machining department. This was equally the case for the industry projects, in which I was involved from 2002 – 2006, where I was a collaborator in two KTI projects with Balzers/Unaxis.

In 2004, my *teaching* activities started: Due to my extensive experience in TEM techniques and with the electron microscopes at ETHZ, I became responsible for the training of the physics- and later also the materials science users on the materials science TEMs at ETHZ. In 2005 I in addition started giving lectures on electron microscopy within the curriculum of the Materials Science Department at ETHZ.

2007-2013 (Staff member at Electron Microscopy Center at ETHZ)

The position as staff person in charge of all materials science TEM topics at EMEZ/ETHZ offered a perfect opportunity to further develop the skills and expertise required for my present position. My main duties were:

- Education of other staff members at EMEZ as well as of users in the materials science field (i.e. non-biological background)
For this task I developed the training concept for EMEZ with the main goals:
 - minimal amount of downtime of the instruments due to operating errors by users
 - Efficient use of the resources (minimal training times), in order to cope with the large amount of trainees
 - Qualification of the users to generate high-quality data in order to reliably answer their scientific questions
- Direct supervisor for 15-20 users working at the TEMs by themselves
- Advice and support for EMEZ staff with biological background
- User support and advice for (potential) users regarding all available TEM techniques
- Management of all materials science TEM service and collaboration projects
- Performing scientific service in collaboration with ETH scientists as well as companies: typically more than 40 (mainly high-end) projects in parallel. As also all experiments regarding biological projects which required spectroscopy or STEM investigations were performed by me, these projects offered me the opportunity for a first step in direction of bio-medical research.
- Scientific responsibility for both high-end microscopes
- Technical responsibility for the spherical aberration corrected STEM
- Establishing new techniques on the two high-end TEMs according to the needs of the users
- Failure analysis on both high-end microscopes
- Lecture on electron microscopy in collaboration with several colleagues
- Person in charge for the electron microscopy practical (1-2 groups of up to 15 students per year, 1 week practical per group; since 2008)
- Public relation work, especially lab tours for visitors
- Successful organization of the EELS/EFTEM workshop at ETH with more than 120 participants (2010)
- I was a collaborator in two European projects (Nanotera and GreenSi, 2009-2013)

Since 2013 (manager of the electron microscopy facility at PSI)

My main tasks at PSI are:

- running the EM facility at PSI (two TEMs, one FIB/SEM, plenty of preparation tools)
- developing the facility to meet present and future needs of PSI scientists
- training and supporting PSI users (at present more than 50 PhDs, postdocs, senior researchers and technicians)
- collaboration with a large number of PSI scientist from NUM, NES, BIO, ENE and SYN e.g. regarding sample preparation for the large facilities (usually by focused ion beam) and electron microscopic experiments in collaborations with and complementary to those of the large facilities
- improvement of safety in the labs

SUMMARY OF MY EXPERTISE

During the past 29 years, I had the opportunity to build up significant expertise and skills in all aspects of operating and maintaining an Electron Microscope facility. They include in particular:

- Broad practical and theoretical knowledge of electron microscopy (EM) in materials science and biomedical sciences.
- In depth knowledge of different EM techniques including HR(S)TEM, diffraction, spectroscopy (EDX, EELS/EFTEM), Lorentz microscopy, etc.
- Detailed knowledge of the different instruments
- Highly experienced in finding and successfully implementing solutions for difficult experimental problems in EM.
- Very experienced in training and supervising EM users with different scientific backgrounds and levels of expertise.
- Excellent organizational skills
- A large network within the EM community