



# Rempfer's Day • Gazette QEM2025



## Gertrude Rempfer (1906 – 1988)

Gert first seriously turned to electrostatic EM design at the Farrand Optical Company, in 1945. Farrand wanted to develop an EM, and Gert's project began with a thorough investigation of the parameters of electron lenses. This was at the suggestion of Reinhold Rüdénberg whom Farrand used as a consultant. She obtained highly accurate data by means of a grating method using an electron-optical bench, however she was not allowed to publish at the time. This outstanding work was not published until 1985, but it became the basis for her future work. An experimental high-resolution electrostatic TEM was developed at Farrand, and results were shown at the 1947 EMSA meeting in Philadelphia. Unfortunately, a Farrand EM never went into production, however Gert received several patents while at Farrand, including one for real-time stereo TEM, and one for a method of correcting spherical aberration using a charged gauze window.

*Gertrude Rempfer - Microscopy Society of America*

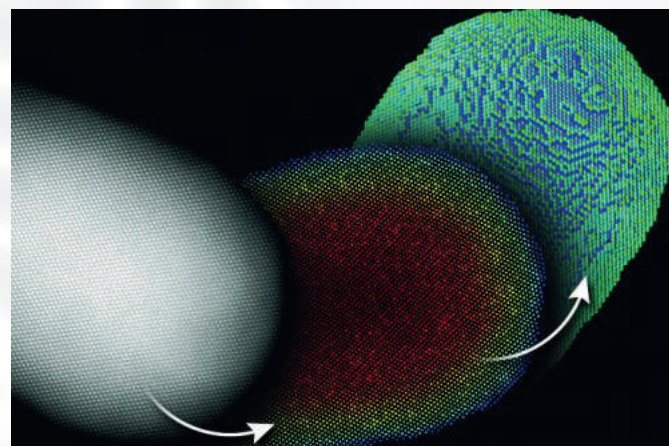
## It happens the same day

In 1995 Alison Hargreaves was the first woman to conquer the Everest without oxygen or the help of sherpas. Something to think about while you are climbing the "pic du Canigou" this week end ;).

## Today's Program

- 9:00** Digital Data Treatment  
by Matthew Bryan
- 11:00** Quantitative Image Analysis  
by Sandra Van Aert
- 13:30** Cup of TEM
- 14:00** Aberration Correction and Energy Filtering  
by Martin Linck
- 16:00** Pacticals
- 21:00** Poster Session (uneven numbers)

## Image of the Day



Today is all about image reconstruction. This is a beautiful example of a 3D atomic model from a single projection using Z-contrast imaging.

*A. De Backer et al, Nanoscale 9 (2017) 8791-8798*

# Teacher's Interviews

## Mathew Bryan

### **Best memory of electron microscopy?**

First time seeing atoms resolved on the screen – not me driving the microscope of course – but of course very cool to see that it's all real down there.

### **How a microscopy lab will look like with AI in 20 years?**

I think a microscope in 20 years will let a researcher spend more time on characterising their sample rather than aligning or searching for regions of interest. I can imagine a system that will handle alignment and mapping a whole TEM grid very quickly, with automatic detection of features, which the researcher can then select for further measurements. AI will intervene at all levels, finding the ROIs, alignment and suggesting appropriate measurement parameters, but I hope that the researcher will still be in the loop for deciding what needs to be done.

### **Apart from Cathodoluminescence which technique(s) you always wanted to learn and didn't?**

I think there is a lot of potential in combining tomography and ptychography, so the whole field of inverse problems is something I don't know enough about and would like to do more of.

### **Wave or Particle?**

Particle, to avoid quite a few headaches

## Sandra Van Aert

### **Best memory of electron microscopy?**

During a training session at the microscope, I was there with Sara Bals—we were already studying together—and it was the first time we met Jo Verbeeck. We were just beginning to learn electron microscopy and that moment turned out to be the start of our careers at EMAT in Antwerp. More than 25 years later, they are still two of my closest colleagues.

### **How a microscopy lab will look like with AI in 20 years?**

I imagine AI will be everywhere : producing, analyzing, aligning, correcting electron microscopy data... maybe even with robots offering you a cup of coffee. But no matter how advanced it gets, we will still need curious, enthusiastic scientists to ask the right questions, validate the data, and provide scientific input to guide AI. So in short: eventually smarter, but still irreplaceably human.

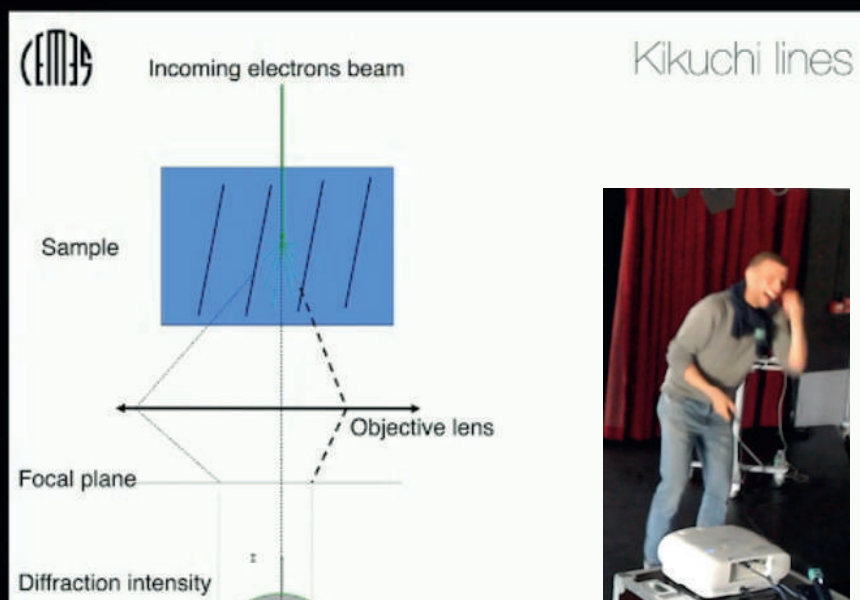
### **Apart from Cathodoluminescence which technique(s) you always wanted to learn and didn't?**

I always wanted to learn how to operate a microscope myself. But after I accidentally switched off the entire system on a Monday morning, I decided it was safer for everyone if I stuck to theory and analysis.

### **Wave or Particle?**

Wave, because I like the idea of being in multiple places at once. How productive would this be !

## Who never heard about the Kikuchi lines ?

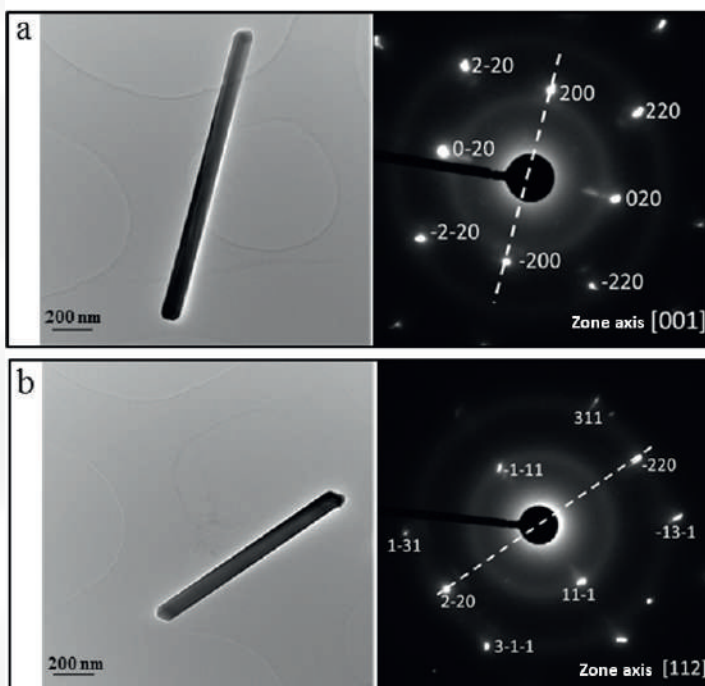


## Pic of Yesterday



## Enigma of the day

**Direct and reciprocal spaces are 3D !!**



Here are two images and diffractions of the same monocrystalline nanorod. This nanorod does not lay flat on the substrate.

Given that the condition for having a  $[uvw]$  direction included in a  $(hkl)$  plan is:

$$hu + kv + lw = 0$$

Find the anisotropy axis of this nanorod ? (i.e. The crystal direction along which the nanorod has grown)

# Secret Recipe : The Punch

## Ingredient:

4 cl of white or dark Rhum  
+ more cl if you want to make some for friends  
1 vanilla pod (or some drops of natural vanilla extract)  
a little bit of pepper  
some fruits if you have very mature ones, sliced thin  
1 cl Sugar Cane (adjust if you put more rhum)  
15 cl of fruit juice that will design your Punch flavour  
(once again adjust with the rhum, do some maths)

## Preparation :

*(If you have a little bit of time, do this 1 h before)*

In a large glass (33cl or more) you put your vanilla, pepper and rhum and let it infusing.

Once it's coloured (the longer the better) you mix it with the sugar.

Then you add your juice and fruits eventually.

Let's continue infusion (inside a fresh space like a TEM chiller or a fridge if you are not officially allowed to open it)... or drink it with ice cubes if you & your friends can't wait.



## Advertisement and News

Don't hesitate to discuss with JEOL  
possible experiment to do during QEM!  
Regis is here to help !

## Weather Forecast

21 °C and a bit Cloudy !

