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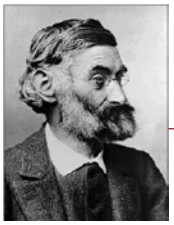

DearAbbe

Dear Abbe,

I have trouble with some of my TEM sections. The sections keep disintegrating or "bursting" under the beam, and I cannot obtain an image. Any solutions?

Annoyed in Antigua

Dear Annoyed,

Quit your whining! At least it's only some of the sections. I remember starting out in EM when our samples were so thick that we could only look in the holes and pretend there was information! I began working on sample preparation with Ernst Ruska and Bodo von Borries while snacking over Käse-igel and lagers. It was problematic until I began perusing papers by Keith Porter—who was working on perfecting an ultramicrotome and associated techniques. Since we were viewing holes anyway, I approached Dr. Porter with the idea of creating a Schrödinger ultramicrotome. This microtome would produce a quantum superposition of sections—simultaneously having sample and not having sample in the sections. You may be having a similar situation: a Verschränkung of simultaneous bursting and non-bursting states of the sections. You'll never know until you look in the scope, but then it'll be too late, or not late enough…

Dear Abbe,

I'm having some issues cutting ultrathin sections embedded in Felix Katt's resin formulation. I started thinking about what happens at the atomic level when the diamond knife cuts a section, how it breaks the bonds of the material being cut, and how the electrons of atoms at the knife edge interact with the specimen atoms' electrons, and I got a headache. What really happens to the sections produced? How frayed are the section faces?

Tattered in Tucson

Dear Tattered,

It's all quantum. Don't worry about what happens since you can't really know. I am still in the process of designing the new Schrödinger brand ultramicrotome (see my response to "Agitated" above), which uses a laser beam instead of a diamond knife to cut the sections. This works nicely since it's a much simpler mechanism. The laser beam moves, and the specimen block is stationary. Unfortunately, in our trial runs a quantum particle, the photon, disrupts the interactions of other quantum particles (the electrons in the atomic bonds), so there's no way to know if anything has happened until the section has been cut or not cut. You're making things more difficult by using Katt's resin. This is well known, amongst those who use it, for either cutting or not cutting, but you can't know which until you look for the section. I usually find it best to wait for the knife boat water waves to collapse and to not look for the sections until after I've had a sufficiency of schnapps so that I'm seeing double. Then the sections can be seen in both the "there" and "not-there" states at the same time. The trick is picking up the "there" sections.

Having metaphysical issues with samples? Ontological issues with coworkers? Let Herr Abbe have a philosophical swipe at them! jpshield@uga.edu.

MT