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Microscopy AND Microanalysis

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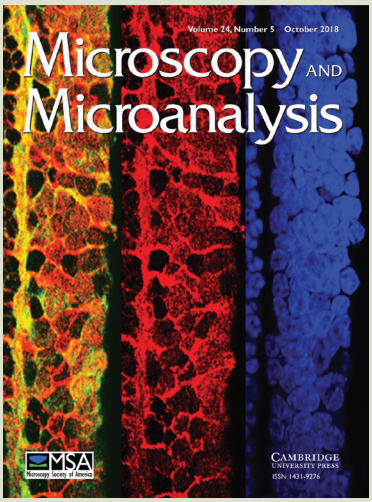

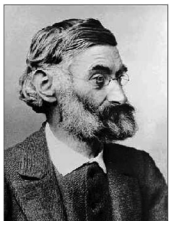

DearAbbe

Dear Abbe,

Like any good microscopist I am always trying to understand what's really happening in my TEM and how an image is formed. As a result, I've taken up studying quantum mechanics. It's been confusing, but as a follower of the "shut up and calculate" school, I didn't let it bother me until I considered the "many-worlds" interpretation of quantum mechanics. Now I wonder: why bother with specimen preparation? In some of the infinite universes, the sample will produce the "real" image without any preparation—who's to say it isn't in this universe? Can you say?

Manifold in Manitoba

Dear Manifold,

Ja! Natürlich kann ich! And in some universe—maybe I'll even tell you. What you have run into my friend is the naturally high value of Quantum Confusion (Q.C.) inherent in microscopy. Not only does your sample give the "real" image in some universes without any preparation, but it gives this image without even being in the TEM! After all, quantum mechanics have made superposition computers superposed in both "on" and "off" states that give a correct answer to a calculation in the "off" state, so why shouldn't a TEM—a large instrument producing very large numbers of quantum events—give the correct image without a sample in it? Nicht wahr? Just remember, there are more grant dollars in "2D representations of low-energy fermion interactions" than there are in imaging anything. Whether and where an electron hits your image recording medium is just a matter of statistics and quantum processes, so with the high Q.C. in the TEM, some image will be formed no matter what your sample is, and whether it looks like what you expect…well, of course this all depends on what your definition of "real" is.

If you are worried about what your TEM is telling you, seek the wise advice of Herr Abbe. You may contact him through his quantum-confused assistant at jpshield@uga.edu.

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