

# **Future Scanning Electron and Ion Microscopy**

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Scanning electron and ion microscopes use finely focused, scanned beams to acquire images, determine the sample shape and size (and composition) and mill and deposit various materials at sub-nanometer, atomic scales. These most versatile instruments have been used for decades in research and industry and they still have a bright future.

Their top performance today is not limited for physics reasons or by the focusing ability of their electron- or ion-optical column, rather by lack of suitable design and by the inadequacy of implemented engineering solutions, so there is plenty of room for improvement. This talk will present the most critical problems in atomic scale measurements and offer solutions that can be implemented in cooperation of scientists and instrument manufacturers.

Hopefully, in the near future scanning electron and ion microscopes will be freed from their shackles and will keep providing indispensable information limited only by the physics of signal generation.