

## MaterialEyes — Seeing the Invisible using Experiment, Theory, and AI

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In the development of materials for realistic applications, the detection and understanding of atomic and electronic structures, especially of defects, interfaces, and nanostructures, is paramount. Advances characterization via electron, x-ray, and atom probes, in imaging, scattering, and spectroscopic modes, have brought us closer to such detection and understanding. However, such experimental data is often difficult to parse and relate to fundamental understanding of mechanisms and behavior at the atomic level. In this talk, I will discuss our efforts in MaterialEyes to use AI/ML and theoretical modeling to enable the seeing of atomic structures from experimental characterization data. I will also discuss our work in using AI to extract and use microscopy and spectroscopy data from scientific literature, and in developing data standards for materials science.

### References

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