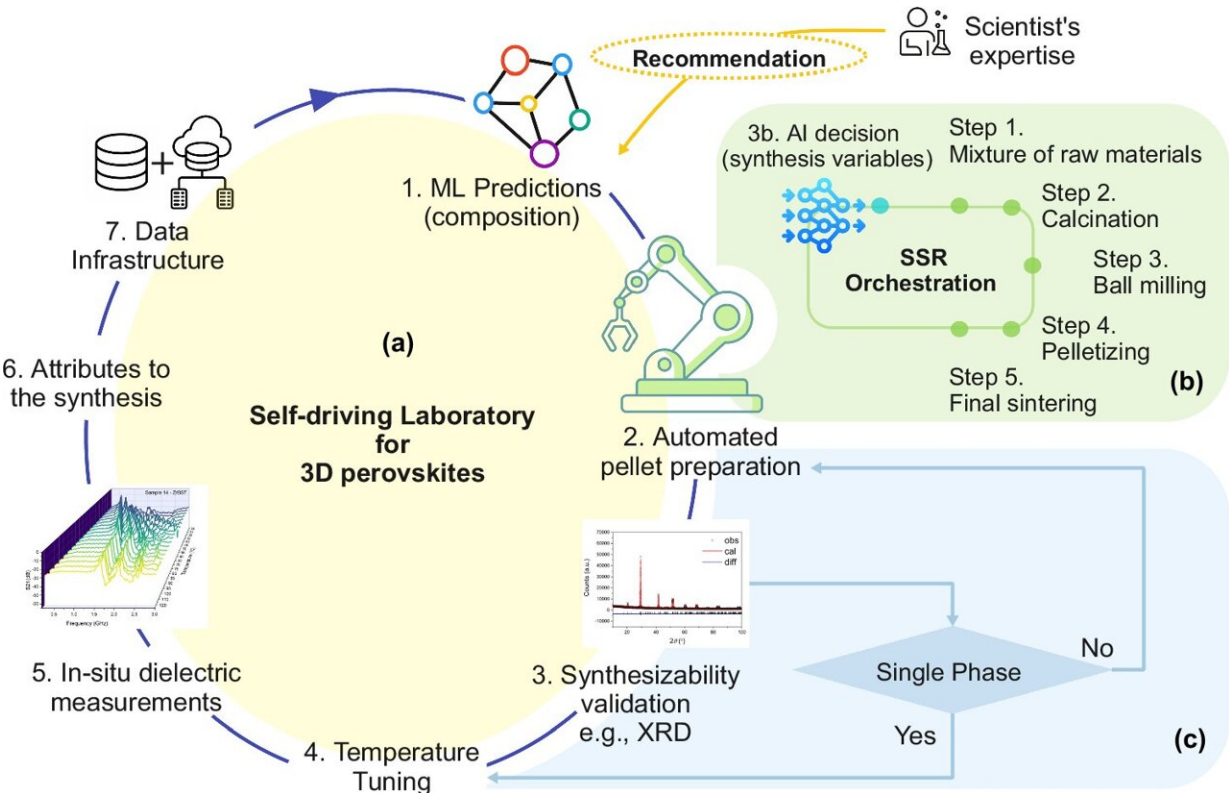


Perovskite discovery goes automatic: New platform expedites material development for next-gen tech

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The workflow concept. Credit: *Nature Communications* (2024). DOI: 10.1038/s41467-024-50884-y

A new research development, [published](#) in *Nature Communications*, from

Queen Mary University of London paves the way for faster discovery of novel perovskite materials with desirable properties for applications in wireless communication and biosensors. Perovskites are a class of materials with a wide range of potential uses, but the vast number of possible chemical compositions makes traditional discovery methods slow and labor-intensive.

This research, carried out by Mojan Omidvar, Professor Yang Hao and their colleagues from the School of Electronic Engineering and Computer Science, introduces an automated platform for rapid sintering and dielectric characterization of perovskite solid solutions. This innovative approach integrates machine learning (ML) for material screening with robotic synthesis and high-throughput characterization.

"The traditional process for discovering new perovskite materials is time-consuming and relies heavily on manual experimentation," explains Mojan Omidvar, Ph.D. student at Queen Mary University of London. "Our automated platform streamlines this process significantly, allowing us to explore a wider range of compositions and identify promising candidates in a matter of minutes."

The new platform drastically reduces processing times compared to conventional methods. Material sintering, which can take hours using traditional techniques, is completed within minutes using the new platform. It also eliminates the need for manual steps such as sample preparation and reheating for characterization, further streamlining the workflow and reduces measurement errors associated with traditional techniques.

On top of that, the integration of ML allows the platform to learn from experimental outcomes and guide future explorations, accelerating the discovery process.

Professor Hao highlights the broader significance of this research and says, "This automated platform represents a significant step forward in the field of materials discovery. We hope it would speed up the development of new [perovskite](#) materials for various applications, from next-generation [wireless communication](#) systems to advanced biosensors."

More information: Mojan Omidvar et al, Accelerated discovery of perovskite solid solutions through automated materials synthesis and characterization, *Nature Communications* (2024). [DOI: 10.1038/s41467-024-50884-y](#)

Provided by Queen Mary, University of London

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