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Charging of carbon thin films in scanning and phase-plate transmission electron microscopy

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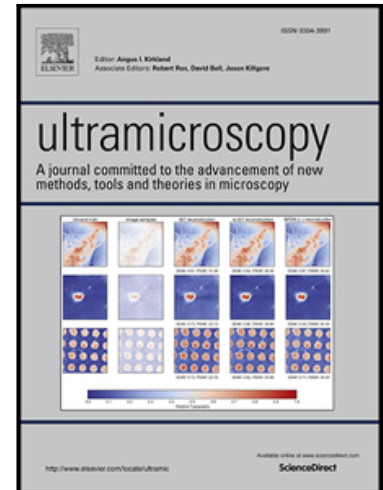
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**Highlights**

- Study on charging of C thin films under intense electron-beam illumination
- Contamination and charging effects are separated by suitable measures
- Observation of weak negative charging of the C thin films at moderate temperatures
- Negative charging is explained by electron-stimulated desorption of adsorbates
- The model is a possible explanation for the functionality of hole-free phase plates

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