Bubble entrapment during droplet impact on heated hydrophobic surfaces

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Motivation
Quantify influence of bubble entrapment on heat transfer performance for droplet impact on a heated substrate

Approach
- Synchronized high-speed optical and infrared (IR) imaging
- Analysis of droplet dynamics and solid-liquid interfacial temperature and heat flux

Key findings
- An increase in surface temperature narrows the Weber number range of bubble occurrence
- The inner contact line can have higher heat flux than the primary outer contact line
- The entrapped bubble reduces the total transferred heat by 5.9% and 6.7% at 50 °C and 65 °C surfaces, respectively