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Watching heat flow near a nucleating bubble SCOTT PARKER, DAVID CAHILL, STEVE GRANICK, University of Illinois, Department of Materials Science and Engineering — When a liquid boils on surface, heat must flow out of the solid substrate and into both the nucleating bubble and the fluid surrounding the bubble. We have developed a high speed thermal imaging technique to observe the spatial distribution of the temperatures on functionalized surfaces in contact with water. This system is used to observe temperatures while growing individual vapor bubbles from a local hot spot on the surface. By varying the average surface temperature and fluid pressure, we tune the growth of the bubble. We report on how the static contact angle and local curvature of a bubble near the surface affect localized heat transfer and the corresponding bubble dynamics.

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