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Transient evolution of dendritic crystal tips and sidebranch structures ANDREW DOUGHERTY, Dept. of Physics, Lafayette College — Dendritic crystal growth is an inherently non-local problem in pattern formation. Although the theory for steady state tip growth is fairly well established, real dendrites also contain a rich sidebranching structure that interacts with the diffusion field. I will report on experimental studies of the emergence of dendritic crystals that explore how the crystal growth speed, tip size, and sidebranch spacing interact as they evolve towards their steady state values. Starting with a small, nearly spherical seed of NH_4Cl held in unstable equilibrium in supersaturated aqueous solution, the temperature is dropped an amount ΔT ranging from 0.1°C to 1.5°C and the subsequent growth is recorded. Even before the steady state tip shape is established, the beginnings of the first sidebranches can be observed, and the dendrite quickly approaches steady state behavior. Once the steady state has been established, the temperature is again changed, and the evolution of the growth speed, tip size, and sidebranch spacing towards the new steady state values will be discussed.

Andrew Dougherty
Dept. of Physics, Lafayette College

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