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Two Dimensional Ice crystals intercalated between graphene and mica. PANTELIS BAMPOULIS, MARTIN H. SIEKMAN, E. STEFAN KOOIJ, DETLEF LOHSE, HAROLD J.W. ZANDVLIET, BENE POELSEMA, University of Twente, MESA+ INSTITUTE FOR NANOTECHNOLOGY TEAM — The physics and chemistry of the interfacial contact between water and solid surfaces are of the highest fundamental and practical interest in environmental sciences, many biological systems and corrosion effects. Water intercalated between graphene and mica has recently received much interest, even amplified by intriguing intercalation effects and by the evolution of fractals. These confined water layers are argued to be ice-like at room temperature. Due to its good thermal isolation from the environment, as a result of poor perpendicular heat transport through both mica and graphene, this system is uniquely suited for studying the consequences of heat transport, due to latent heat effects, during growth and melting of 2D ice crystals. The enigmatic growth of ice crystals poses a longstanding fundamental problem and its solution is possibly hidden in influences of heat and particle transport. Indeed, we find that heat and particle transport play a crucial role in the growth of ice crystals under high-temperature and high supersaturation conditions.

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