Under Pressure: When Bubbles Crack

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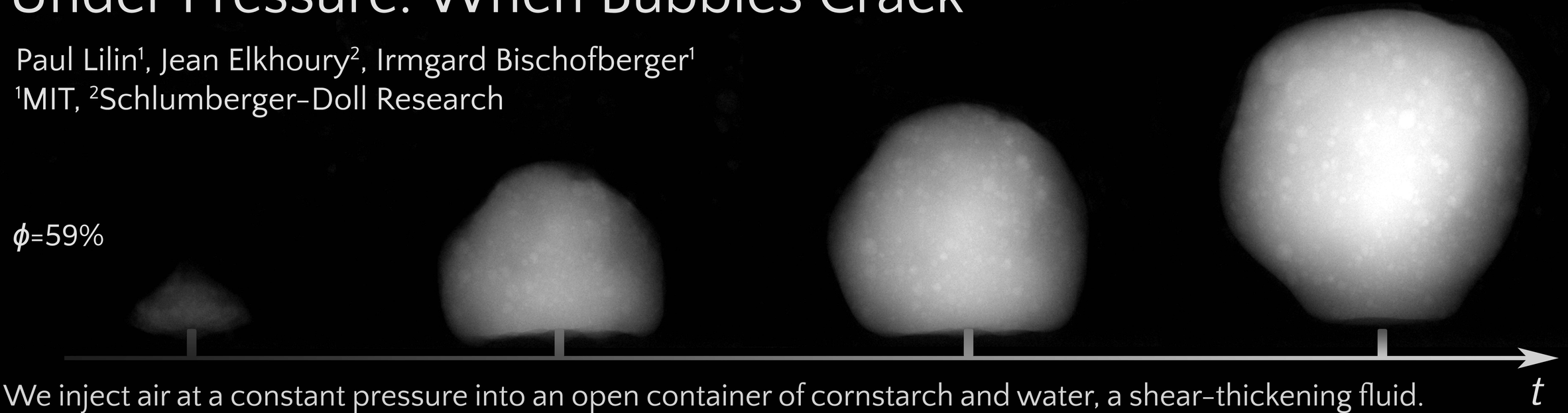
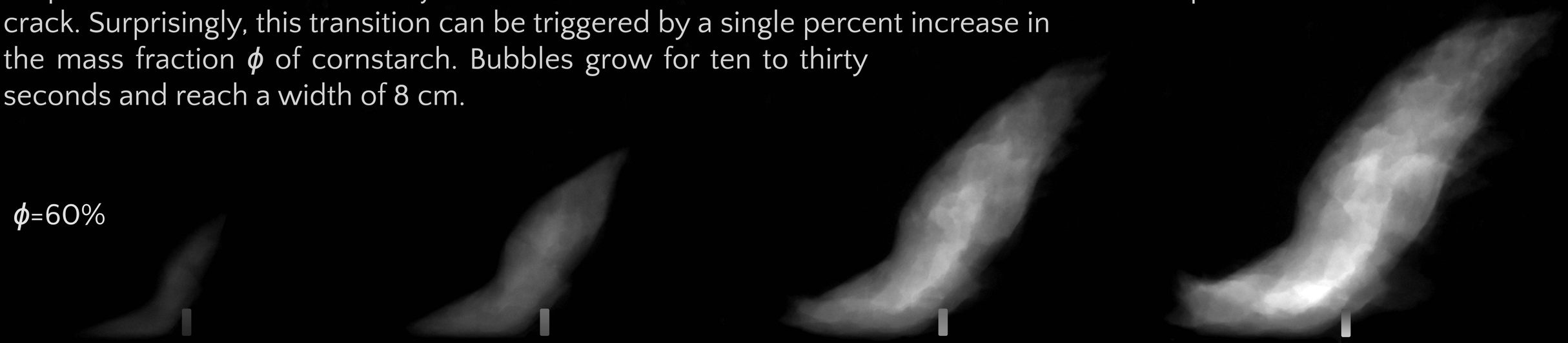
We inject air at a constant pressure into an open container of cornstarch and water, a shear-thickening fluid. X-ray transmission images reveal the shape and thickness of the air cavity inside the opaque sample. As pressurized air leaves the injection needle, it forms either a smooth bubble or a sharp crack. Surprisingly, this transition can be triggered by a single percent increase in the mass fraction ϕ of cornstarch. Bubbles grow for ten to thirty seconds and reach a width of 8 cm.