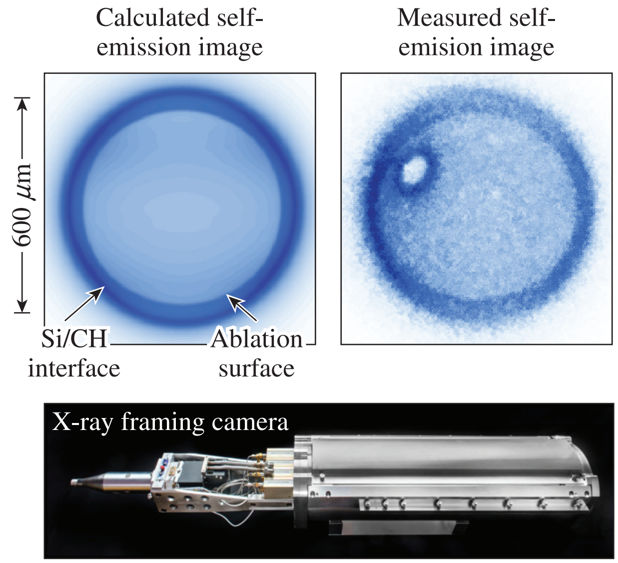
About the Cover:

The cover photo shows Physics and Astronomy graduate student Amanda Davis with an x-ray framing camera used to measure x-ray self-emission. She reports on experiments that angularly resolve the mass ablation rates and ablation-front trajectories in order to isolate and quantify cross-beam energy transfer (CBET) in direct-drive implosions on OMEGA and at the National Ignition Facility. Sixteen 2-D images of the coronal x rays were taken throughout the implosion using four-strip x-ray framing cameras as shown below.

X-ray self-emission images of Si-coated CH target implosions were used to determine the mass ablation rate of Si and the ablation-front trajectories of the target. Adding a thin layer of Si over a CH shell generates two peaks in x-ray self-emission images, indicating the position of the ablation front and the interface of the two layers in the plasma. The emergence of the second peak is used to measure the burnthrough time of the outer layer, giving the average mass ablation rate of the remaining Si layer and instantaneous mass.



This technique was adapted to measure the angular mass ablation rate in polar-drive experiments where CBET predominately affects the drive on the equator. The effects of CBET were isolated by simultaneously measuring the distances between the radii of the outer Si layer and the inner ablation front at the pole and the equator. These results are being used to validate the 2-D CBET and nonlocal thermal-transport models at direct-drive–ignition plasma conditions.

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