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UPLiFT: UK Programme of Laser Inertial Fusion Technology for Energy

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UPLiFT is an ambitious programme of scientific and technological development which aims to lay the foundations to enable a future demonstration of laser inertial fusion energy. In this talk I will discuss the steps required to make progress along this path, and our current programme.

The technological developments are currently focussed on implosion target manufacturing and characterisation, and broadband, high efficiency, high repetition rate lasers which are designed specifically to reduce cost.

UPLiFT's science is focussed on understanding the physics of direct drive, and specifically that which differentiates it from indirect drive; laser-plasma instabilities, imprint, and non-local transport. A focussed programme of inline model development, combined with dedicated experiments to benchmark the models, will de-risk implosion designs for a future laser system.

Implosion design work will evaluate both conventional direct drive, and Shock-Augmented Ignition[1] approaches. Shock-Augmented Ignition is a relatively new Laser Inertial Fusion concept which, based on our work to-date, may enable higher yield with implosions that are less exposed to deleterious hydrodynamic and/or laser-plasma instabilities.

[1] Scott *et al*, Physical Review Letters, (2022).
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