
UK Atomic Energy Authority

UKAEA

# Thoughts from the UK

6 December 2017 – Steve Cowley

Partly on behalf of Ian Chapman

# Where are we?

- Yearning to burn – ITER can do it.

- We need innovation before we can make commercial fusion reactors.
    - Bringing down the cost and scale of fusion reactors

Plasma Physics – function of shape etc.

$$nT\tau_E \sim F B^4 L^3$$

Engineering

$$Plasma\ \ Power\ \ Flux\ \ to\ \ Divertor \sim G\beta^2 B^5 L^2$$

# Fusion needs integrated solutions

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UK committed funding until 2020 for JET D-T campaign

JET for burning plasma science

£21M enhancements package secured from UK and EU

MAST Upgrade for Exhaust

Royce funding secured for next few years

Materials Research Facility (MRF)


Planned new facility

Fusion Technology Facilities (FTF)

Remote Applications in Challenging Environments (RACE)

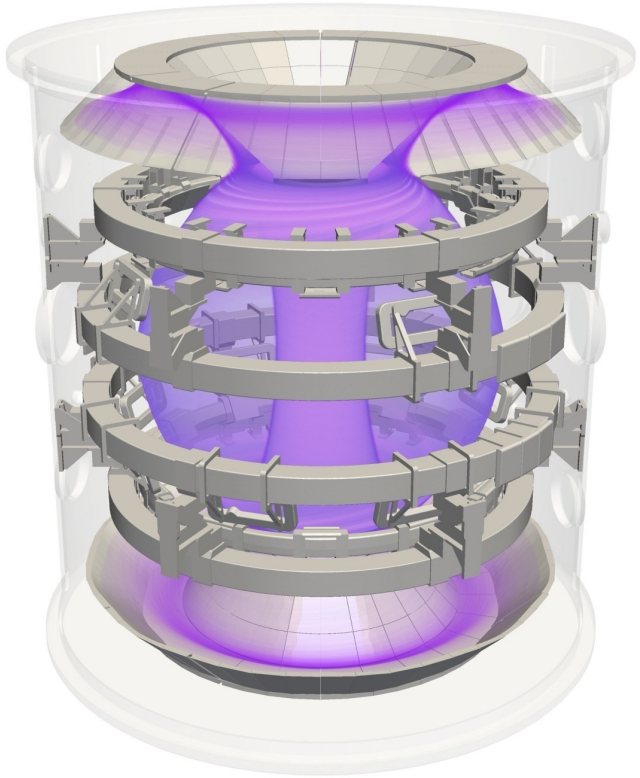
Funding secured for RAI in Nuclear

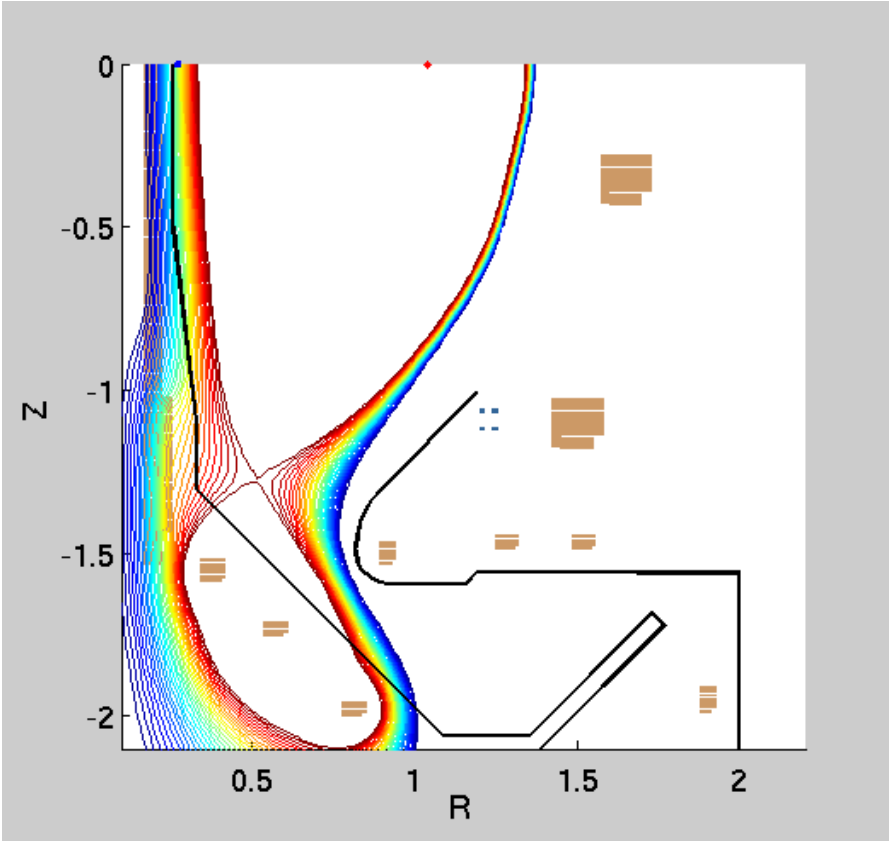
Planned new facility

$H_3$ Advanced Technology (H3AT)

# MAST Upgrade

£50M UK device to test novel ways to handle heat flux and make fusion reactors smaller and cheaper





# Constructing MAST Upgrade

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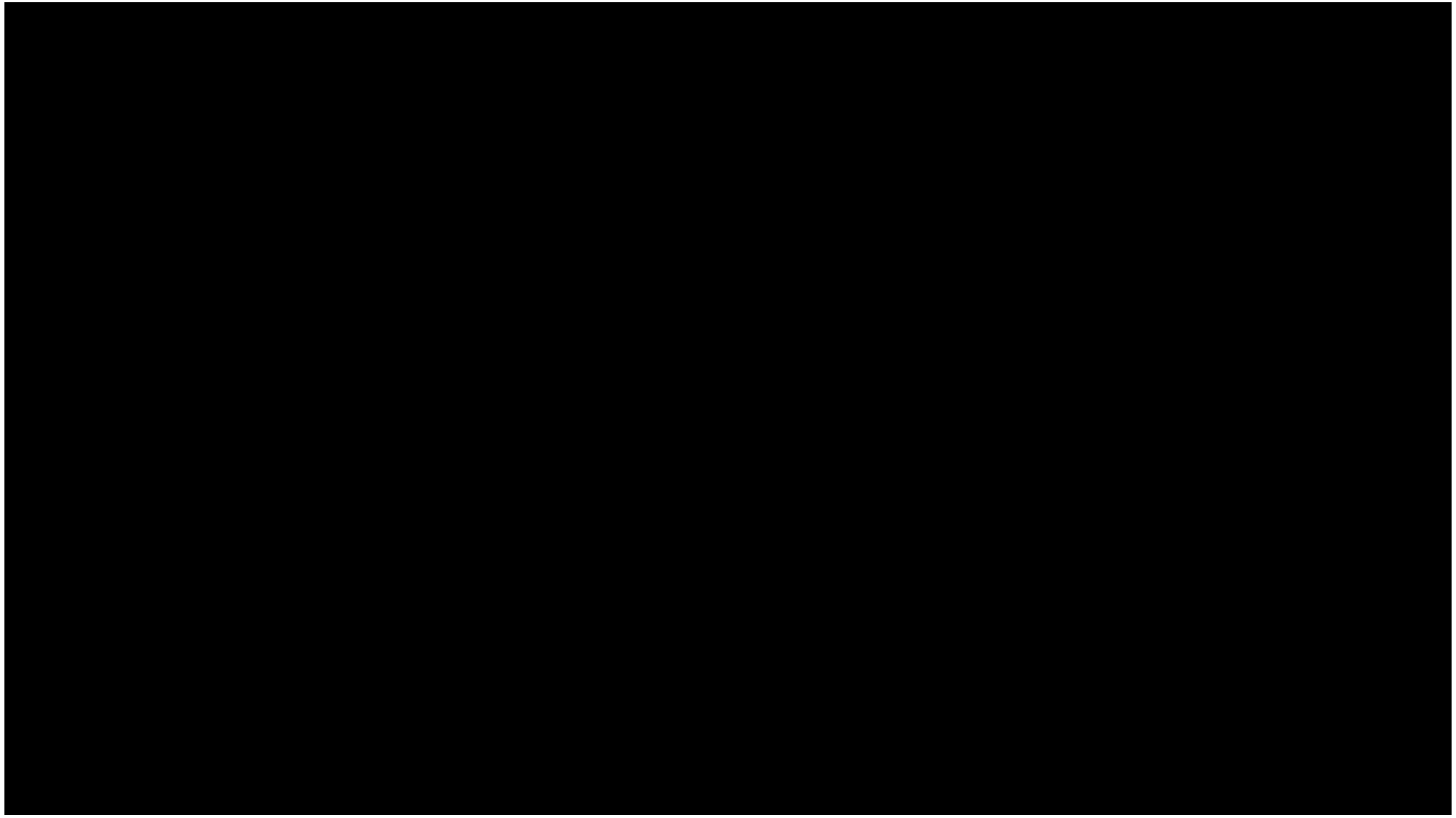

# Latest on MAST Upgrade

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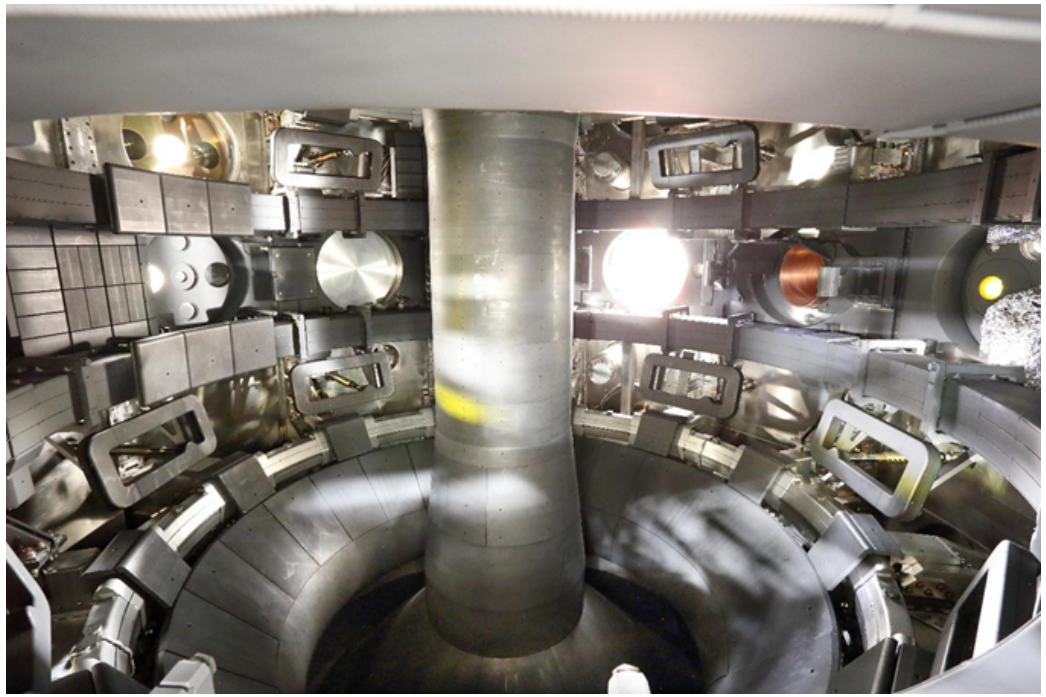
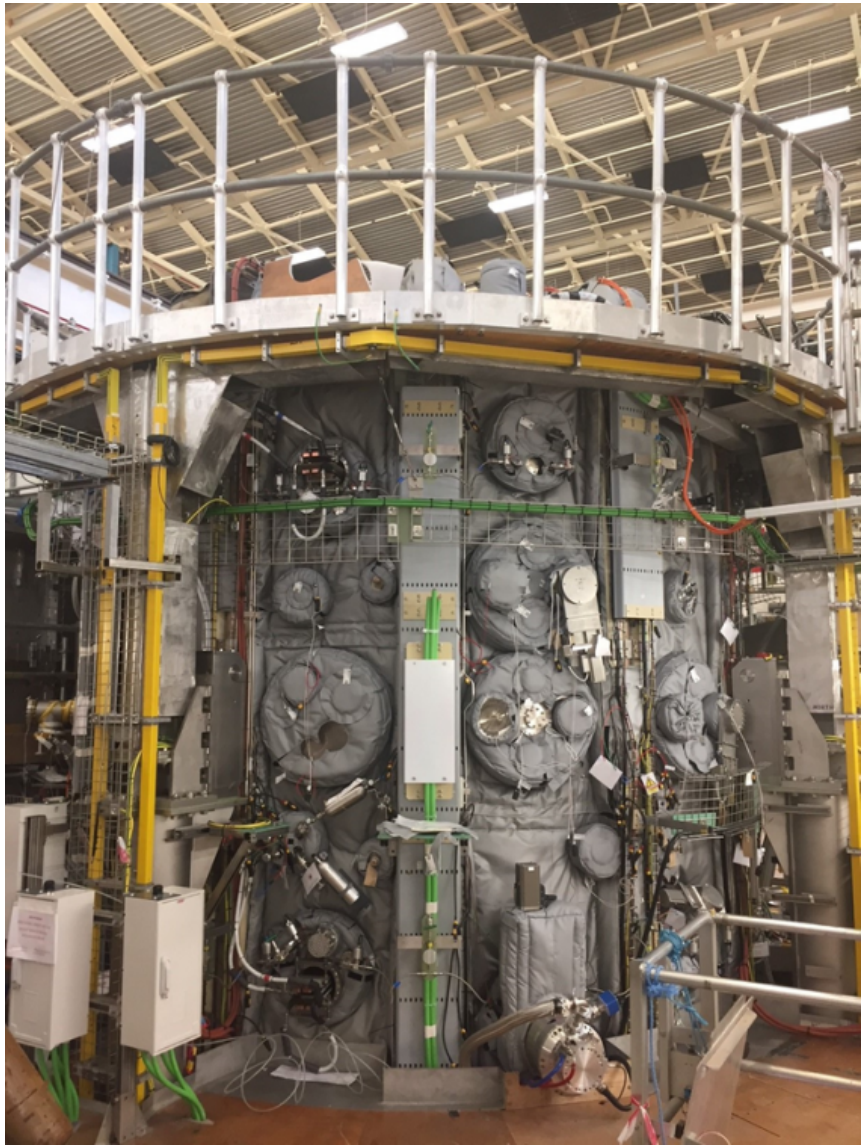
Vessel assembly is complete and ready for bake

Restart and commissioning planned for six months

First plasmas expected in June 2018





# Can't finish a talk without mentioning Brexit…

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UK Government have **committed to continue paying its fair share of JET operation until 2020 to enable the D-T campaign**: "JET is a prized facility at the centre of the UK's global leadership in nuclear fusion research, which is why the government is taking every possible step to secure its future. It is our desire for this valuable work to continue uninterrupted"

In a Policy statement on the UK's future relationship with the Euratom it states that: "It's in our mutual benefit to maintain this successful partnership, and this paper clearly outlines our desire to have a full and open discussion with the EU to shape our joint future. **The UK hopes to find a way to continue working with the EU on nuclear R&D, including the JET and ITER programmes**"

# Conclusions

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UK government have repeatedly stated their intention to continue JET operation and ITER participation

Two new facilities planned at Culham

- H3 Advanced Technology (H3AT) centre
- Fusion Technology Facility

We can and will bring down the cost and scale of fusion.