‡

2-02 18:12:10:33

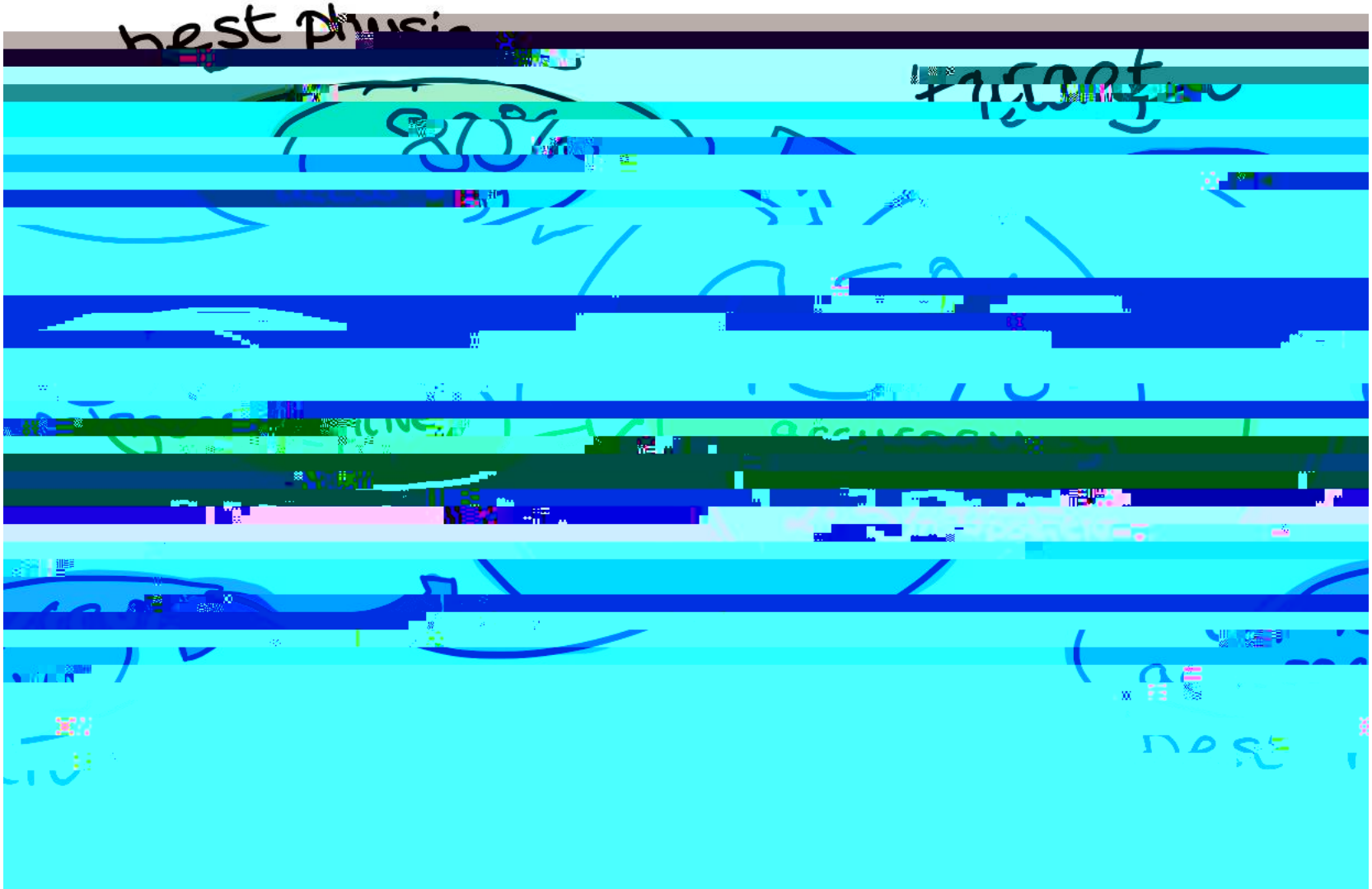
“On a small tokamak, it doesn’t matter so much if you let the plasma go bang…”

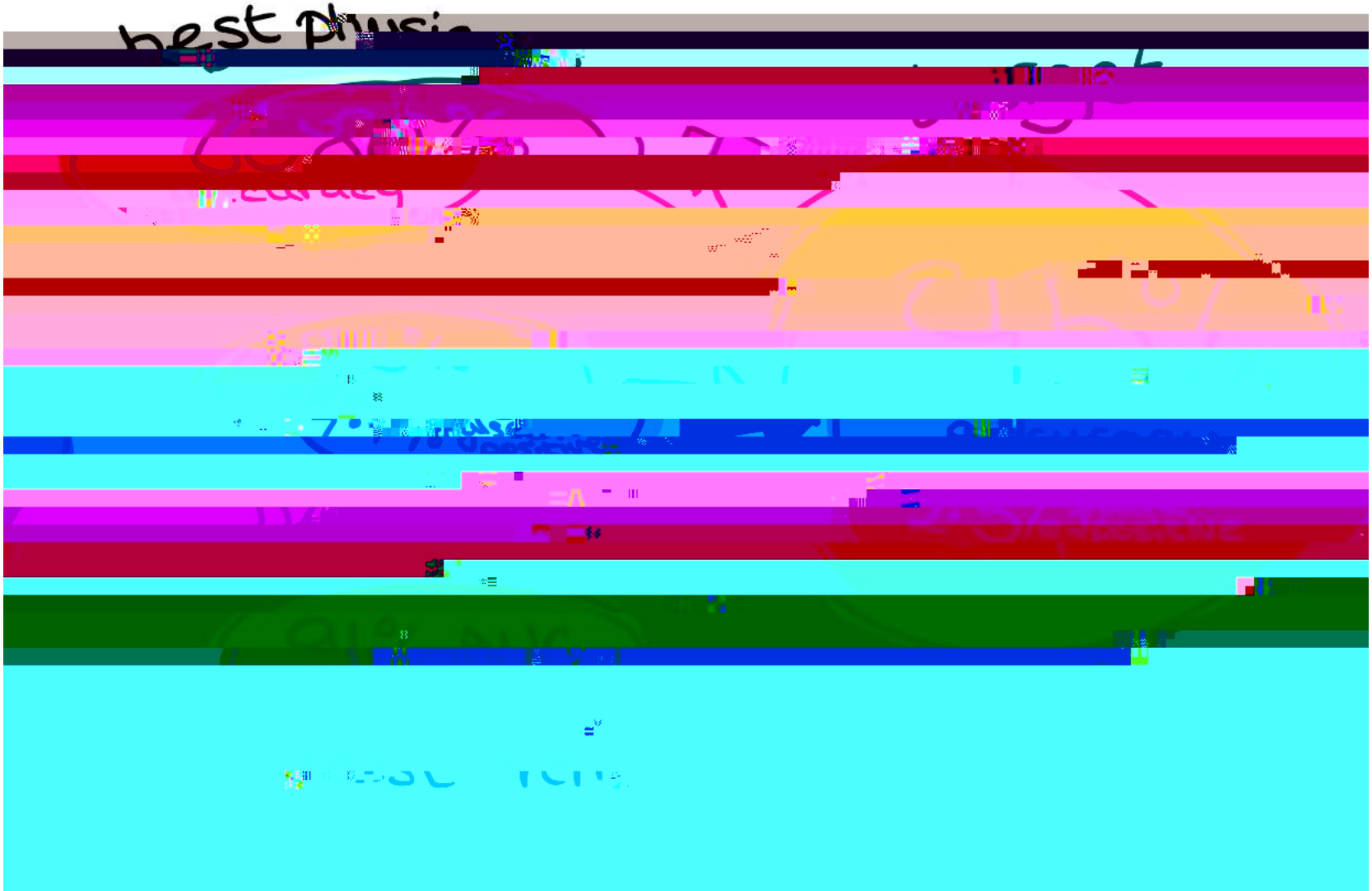
- It gets worse
- 15000 tons worse

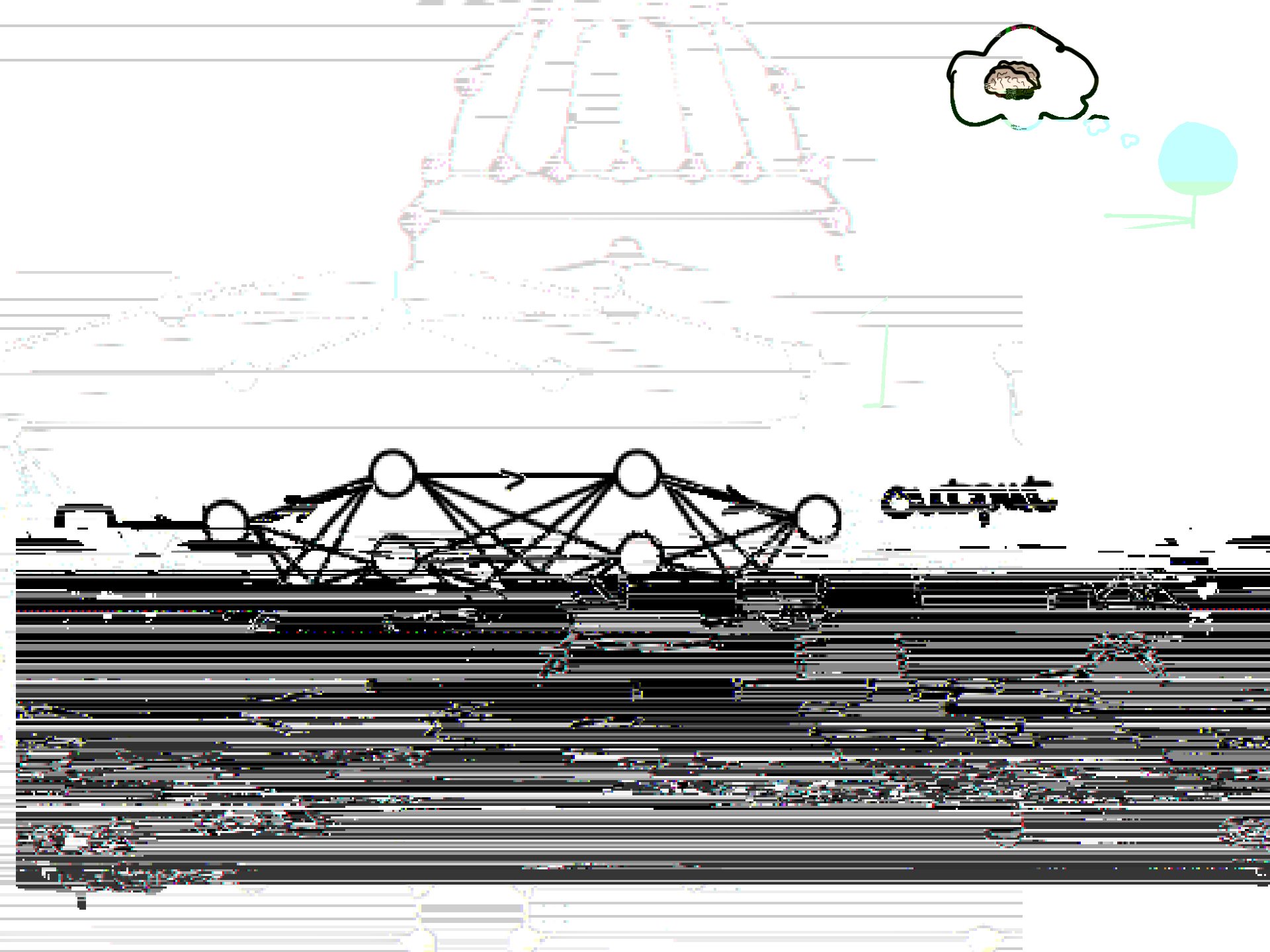
- Remind audience that disruptions are not meltdowns

- All is not lost!
  - 30ms warning needed

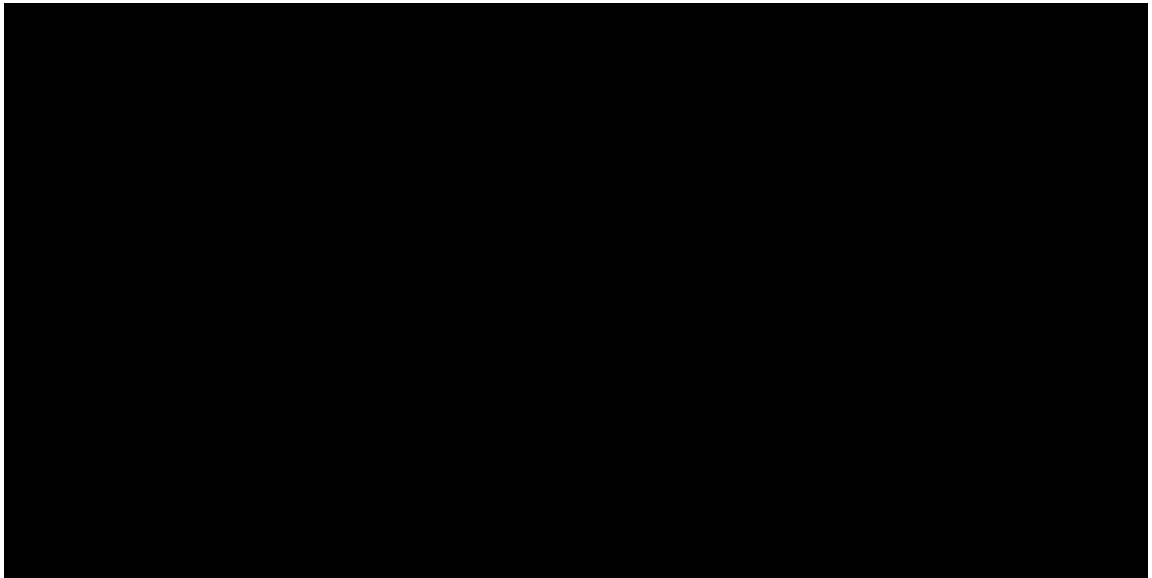
best physic



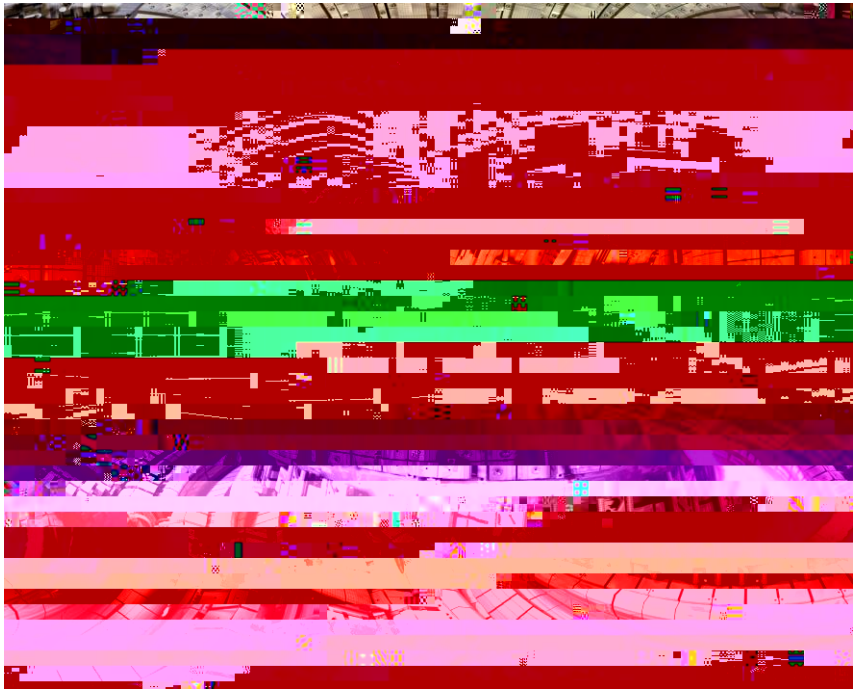

best physics



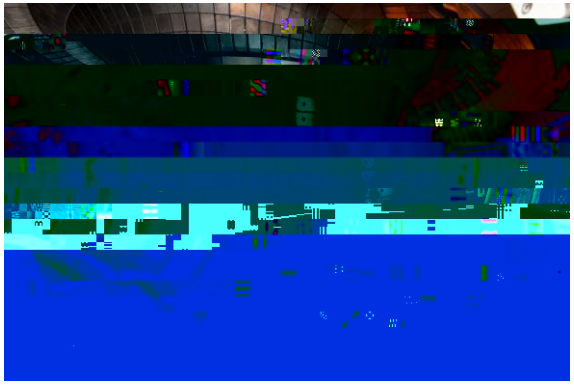
- Fusion Recurrent Neural Network
  - Inputs: various tokamak diagnostics, every 1ms
  - Outputs: time to disruption/chance will disrupt



JET



ASDEX-U



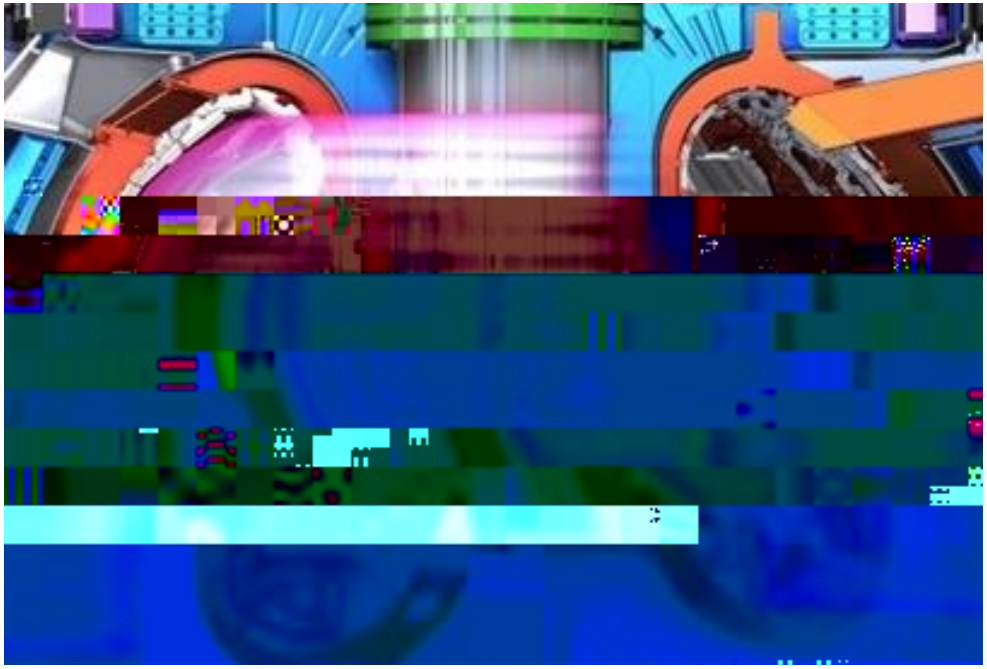
COMPASS

0.56m

1.65m

2.96m

ITER



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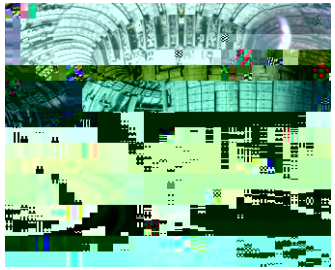

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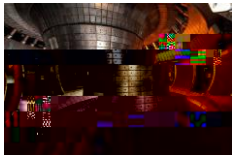


COMPASS

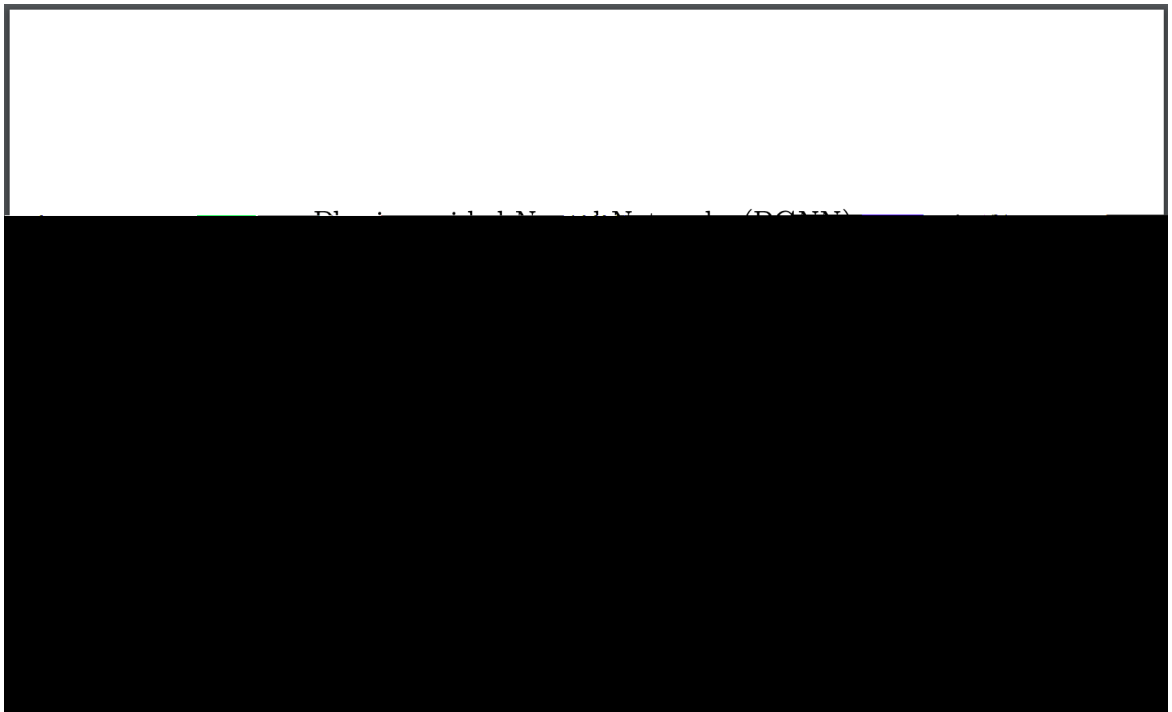
0.56m

1.65m

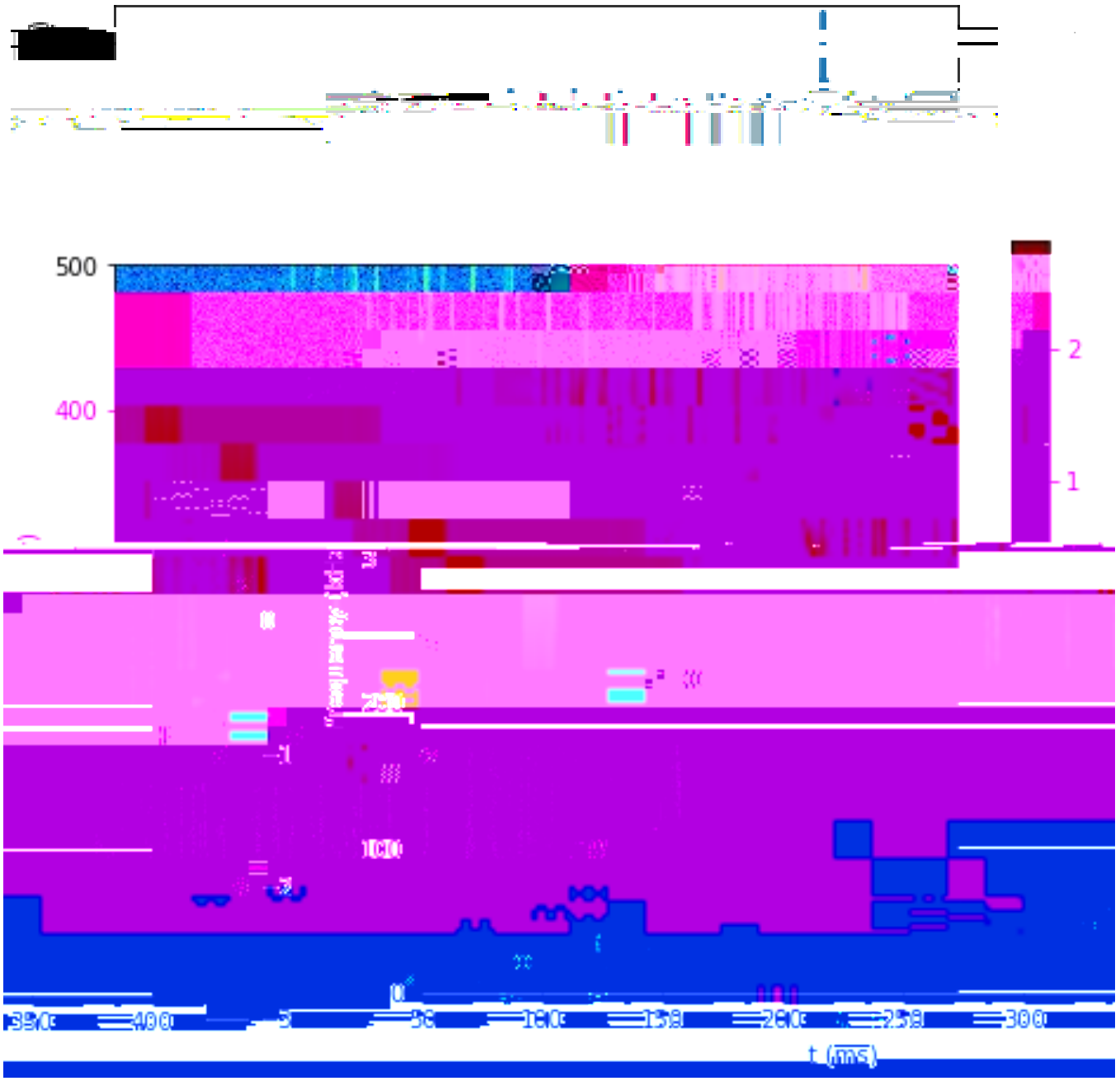
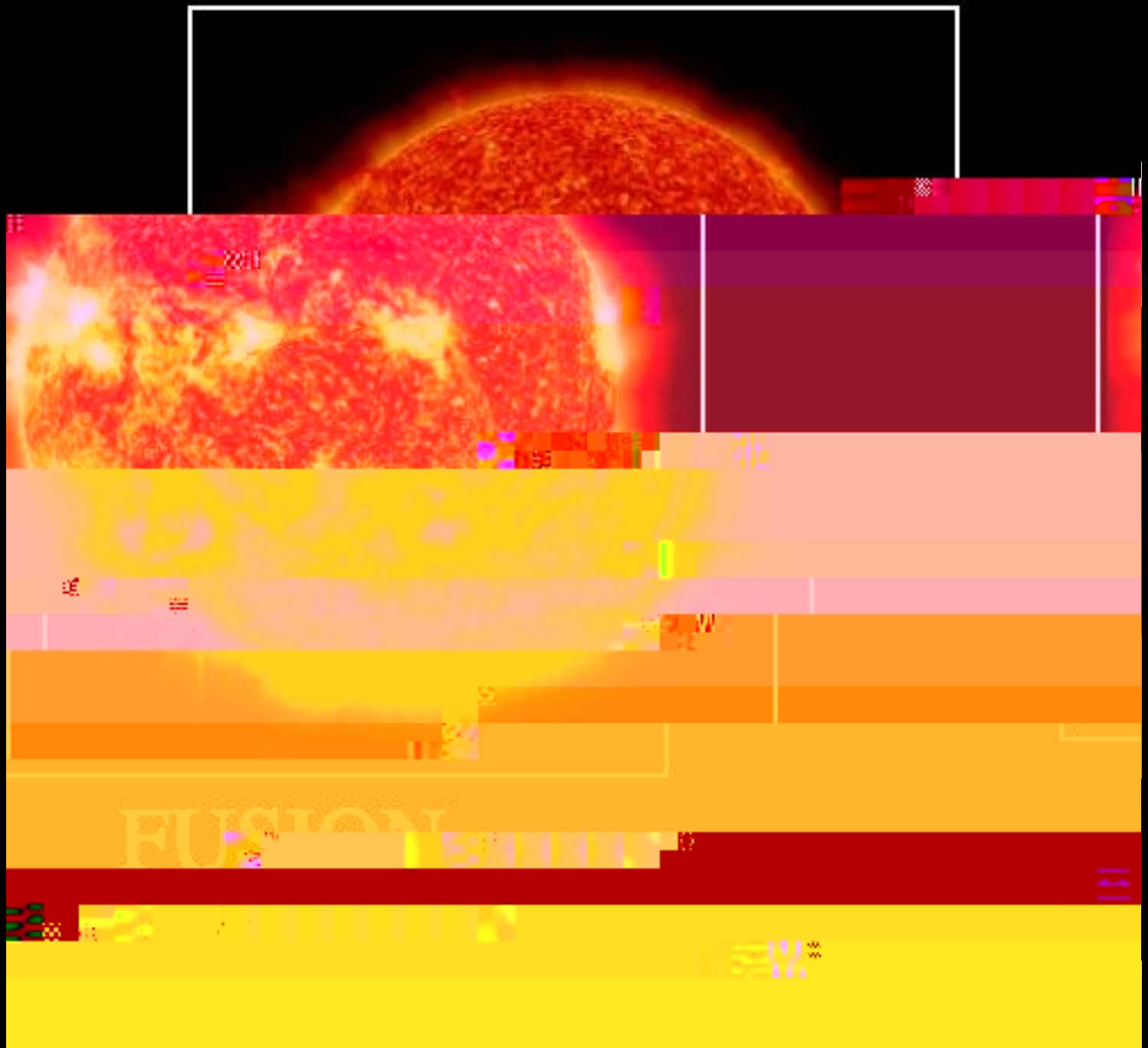
2.96m

6.2m

- Physics Guided Neural Networks (PGNNs)
  - Include physics laws in loss function



Fourier transforms


500
400
2
1
t (ms)