**Problem (challenge):**
Can we have fast, precise and traceable to international standards (SI units) models of complex dynamic systems?

How much can we trust them and what are the most optimal Machine Learning (ML) architectures and data/theory leveraging schemes?

**Solution:**
1) Leverage optimal fusion of theoretical understanding, numerical and experimental data – *multifidly physical guided machine learning*.

2) Embed real world-sensors uncertainty and noise signatures in ML models architecture.

3) Provide procedures for robust calibration and uncertainty estimation of physics guided ML models.

**Impact:**
Enabling next generation ML tools for real-time modeling and control of complex nonlinear physical dynamics systems.

Enable tackling of previously unsolved problems such as: plasma instabilities prediction and control.