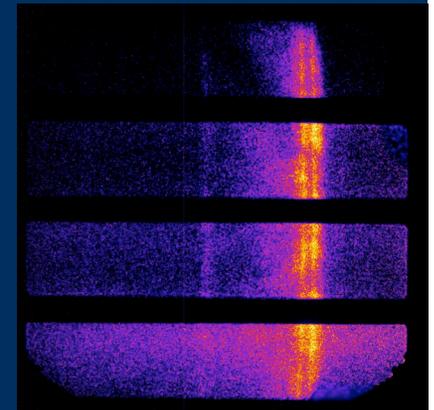


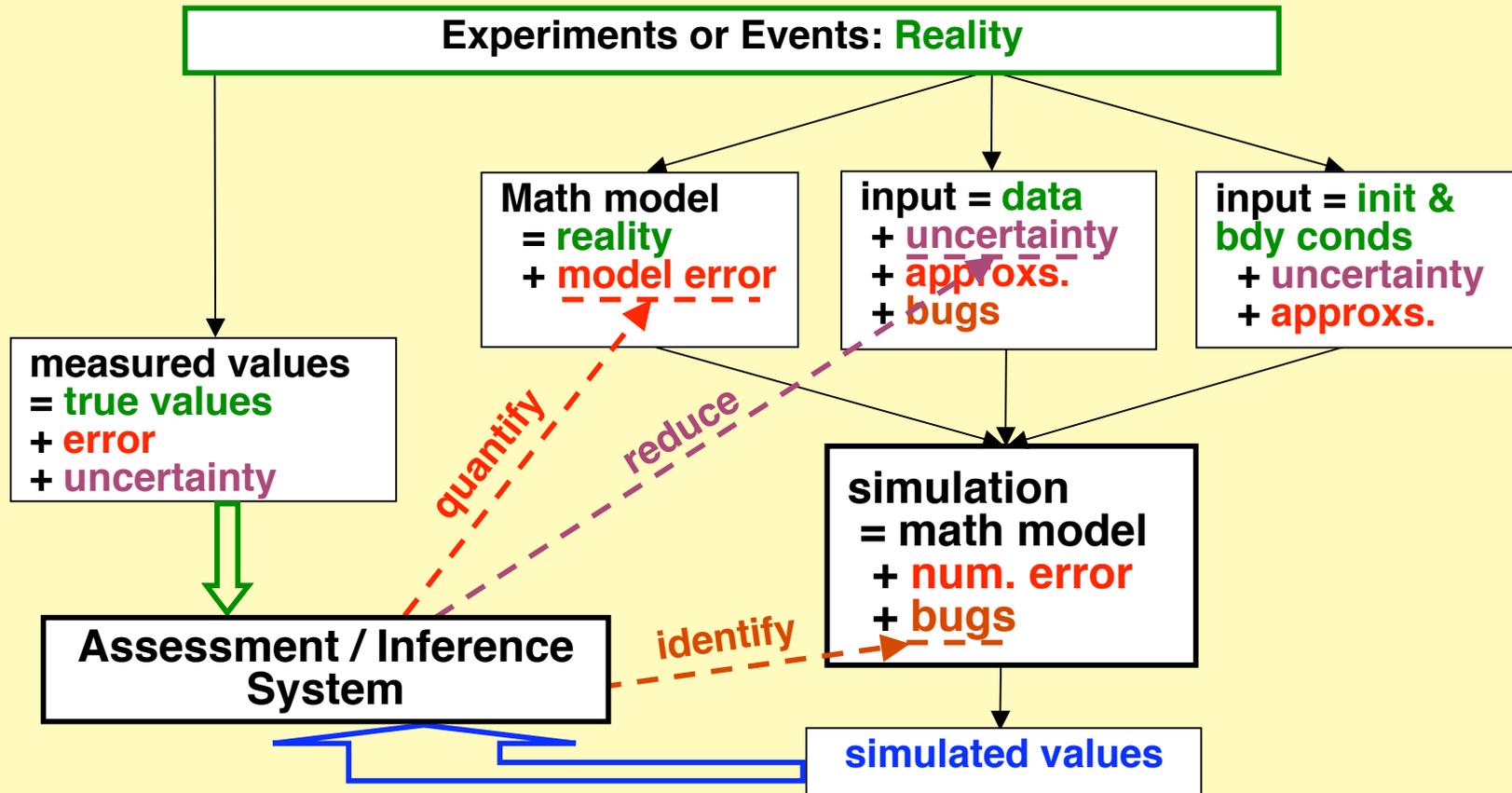
Center for Radiative Shock Hydrodynamics (CRASH)

UQ Challenges

R. Paul Drake, Project Director



We must go beyond traditional V&V and UQ

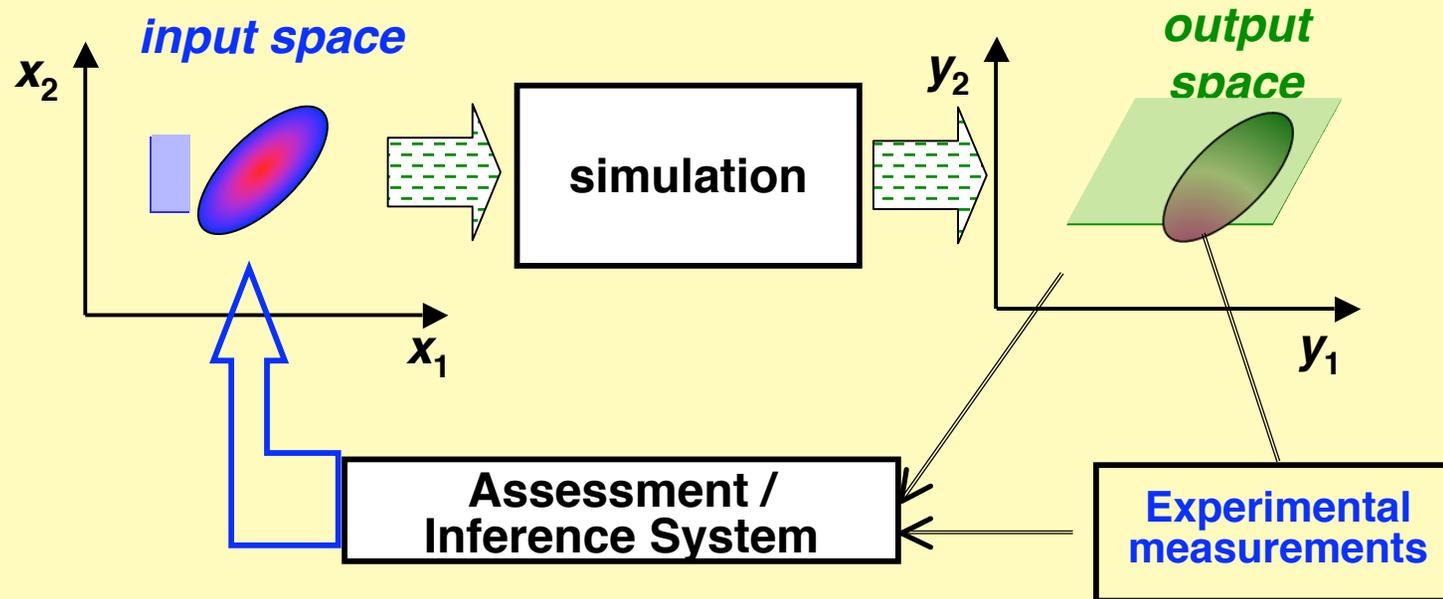


After this, must assess *predictive capability for next event.*

Inference should be systematic & transparent



- Primary tool will be a **Bayesian Hierarchical System**
 - Builds posterior input-parameter distributions
 - Builds model-discrepancy function



- We also have an adjoint methods expert on our team and will pursue these methods too, in particular to guide grid refinement

Our specific challenges in UQ



- **First of all, we have a lot to learn**
 - All our research *faculty members* will become involved
 - Several of our instructional faculty members will too
- **Ultimately, our problem is beset by model limitations**
 - Known models cannot be high-fidelity representations of reality in general contexts
 - Degree of fidelity will be computationally limited as well
- **We need to figure out the principles that let us quantitatively answer**
 - How bad is good enough?
 - Our Bayesian methodology should help address this
- **Then we need to develop methods by which we can apply these principles to the problem of predicting the next experiment**