

**UCLA Proposed Work for IFE Development**

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# UCLA Proposed Work for IFE Technology Development

## 1. Experiments, Modeling, and Analysis for IFE Chamber Technology

*- The IFE chamber technology has many critical issues which will not be addressed by the basic NIF device.*

### Critical Areas of High Priority for Near-Term R&D :

1. *"Wall protection schemes"*

2. *"Performance and protection of optics system in laser-driven devices."*

*- We need to have a good program of experiments, modeling, and analysis in these areas.*

*- A credible wall protection scheme for IFE reactors needs to be developed.*

*- Work has begun at UCLA in these areas.*

Other Critical Areas:

3. *"Activation/Shielding Issues in NIF/IFE"*

4. *"Structural Response to Pulsed Load"*

5. *"Blanket Technology"*

6. *"Tritium Self-Sufficiency : Dynamic Modeling of Tritium Fuel Cycle"*

## 2. IFE Technology Testing on NIF

- With NIF as the next ICF facility, we have to focus on how best to use it for serving the IFE needs.

- We propose to establish an "IFE Technology Testing Group for NIF" .

- The purposes of the group are:

- 1) *to evaluate proposals for IFE-relevant experiments on NIF,*
- 2) *to prioritize these experiments,*
- 3) *to interface with the "NIF-facility designers" to discuss needs for experimental ports (location, size, remote handling, etc.),*
- 4) *to design the experiments,*
- 5) *to develop a description of the IFE Technology Testing Program on NIF, and*
- 6) *to identify the R&D needs required prior to constructing and performing the IFE technology experiments on NIF.*

- UCLA has established such a group for ITER.**
- UCLA has a unique experience in leading such a group**
- The experiments conceived to be of high priority for testing on NIF will have R&D needs. These R&D needs should receive priority in IFE technology efforts.**

### 3. IFE Development Plan

- Current efforts by LLNL and UCLA on IFE Development Plan are very useful but the serious limitation on resources limits the depth/credibility of such plans.

- The IFE development program can greatly benefit from a more comprehensive approach, e.g. "FINESSE-type study" (that was conducted for MFE) that involves the following:

- *studying the technical issues,*
- *investigating the needs for experiments,*
- *identifying existing and new facilities for conducting these experiments, and*
- *developing an overall plan for R&D.*

- **This effort requires considerably more resources**

*(Can FY 96-98 budget provide sufficient resources for this effort?)*

## Summary of UCLA Proposed Work for FY 96-98

- **Experiments, Modeling and Analysis for IFE Chamber Technology**
  - **Thin-Film Wall Protection Scheme**
  - **Laser material Interaction**
  - **Activation/Shield Analysis for NIF/IFE**
  - **Structural Response to Pulsed Loading**
- **IFE Technology Testing on NIF**
- **IFE Development Plan (FINESSE-TYPE Study)**