

# **INERTIAL FUSION ENERGY: need for planning for ignition and post-ignition on the National Ignition Facility**

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**Plasma Science Committee Meeting**  
**National Academy of Science**  
**Washington DC, April 13, 2007**

# INERTIAL FUSION ENERGY FUNDING

**ICF and High Yield Campaign: \$418M requested for '08**

**Indirect Drive Physics: NNSA → National Ignition Facility**

**Indirect Drive Physics: NNSA → Z (Sandia National Lab)**

**Direct Drive Physics: NNSA → OMEGA (UR), Nike (NRL)**

**Direct Drive IFE Technology: NNSA → HAPL (\$25M/y congress. earmark)**

**Fast Ignition Research: OFES → (\$3M/y + 2M/y congressional earmark)**

**Fast Ignition Facilities (OMEGA EP, ARC): NNSA**

**Heavy Ion Fusion (re-oriented towards WDM physics): OFES, \$6M/y**

**Z-pinch IFE: NNSA (\$4M/y, congressional earmark)**

← Not in the president budget request

# **DIRECT DRIVE IFE RESEARCH**

**Direct Drive is probably the most promising route to IFE**

**Direct Drive Physics: NNSA → OMEGA (\$40M/y, UR), Nike (\$15M/y NRL)**

**Direct Drive IFE Technology: NNSA → HAPL (\$25M/y congress. earmark)**

**About 50% of the Direct Drive Research is funded by congressional earmarks**

# **DIRECT DRIVE IFE AND NIF IGNITION**

- For NNSA, Direct Drive is an alternative option for ignition (Back-up plan)
- No plans for the National Ignition Facility to operate in symmetric Direct Drive.
- Polar (Non-symmetric) Direct Drive may be tested on the NIF
- No plans for the necessary laser smoothing (2D-SSD) for direct drive on the NIF
- Changes for success: minimum (personal opinion) unless the smoothing and/or symmetry requirements are met.

**There are not adequate plans for a successful Direct Drive campaign on the NIF**

# **Heavy Ion Fusion Research**

→**Heavy Ion Fusion Research:**

**Lawrence Berkeley Laboratory ~ \$5M**

**Princeton Plasma Physics Laboratory ~\$1M**

→**The program has been re-oriented toward  
Warm Dense Matter physics**

**NO CLEAR DIRECTIONS FOR THE ROLE OF HIF  
IN THE ADVANCEMENT OF INERTIAL FUSION ENERGY**

# **INERTIAL FUSION ENERGY IS A RESEARCH PROGRAM/AREA IN SEARCH OF DIRECTIONS**

→ Possible NRC Review ?

→ Questions to be addressed:

- (a) Is the IFE program ready for ignition on the NIF?**
- (b) Is the IFE program adequately funded?**
- (c) What are the post-ignition plans for IFE research?**
- (d) Is IFE a promising route to useful fusion energy?**
- (e) How does IFE compare to MFE?**
- (f) Are government agencies (OFES, NNSA) providing the necessary structural and managerial support for Inertial Fusion Energy research.**