

Nano-Scale Fusion

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Nano-Scale fusion is controlled nuclear fusion process that employs the disciplines of fusion technology and nano technology. The objectives of this work is to explore the advantages afforded by nano structures in accomplishing controlled fusion.

Brief:

Nano scale fusion is an inertial confinement fusion (ICF) employing endohedral fullerenes, nano-structures encapsulating D-T hydrogen isotopes. Fusion ignition as in conventional ICF requires laser or similar electromagnetic drive.

Advantages:

Fusion advantages

The advantages of the nanostructure over the conventional 1 millimeter scaled glass or plastic pellets is lower ignition energies, improved coupling efficiencies, higher fuel densities, and lower contamination.

Use of nano structure in ICF enables additional latitudes in design of the fusion reaction that are not possible with conventional millimeter scales. These advantages include on nano-scale laser amplifiers built onto the fuel structure, fuel systems comprising multi-fullerene assemblies.

Reactor operational advantages

The endohedral fullerene fuel structures can be breed in the fusion reactor plant as a flow process enabling continuous operation and lower cost operation.

Ongoing work

Additional concepts are being explored that are enabled through the employment of nanostructures.