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The Quest for Fusion at the National Ignition Facility[1]

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Arthur Eddington speculated in 1920 on the internal constitution of stars and described the possibility of nuclear fusion based on the then new results from special relativity and measurements of light nuclei masses. By 1929 Atkinson and Houtermans worked out the calculations for nuclear fusion in stars and initiating nuclear astrophysics. All of these sciences were pressed into service during the World War II, and the applications developed, particularly under the auspices of the Manhattan Project provided both weapons with which to wage and win that conflict, but also the possibilities to harness these applications of the nuclear processes of fission and fusion for peaceful purposes. 32 years after Eddington's speculation the United States demonstrated the application of fusion in a famous nuclear weapons test. In the following years many ideas for producing "controlled" fusion through inertial confinement were pursued. The invention of the laser opened up new avenues which have culminated in the National Ignition Facility, NIF. I will attempt to cover the ground between Eddington, through the Manhattan Project and provide a current status of this quest at NIF.

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