FLASH code

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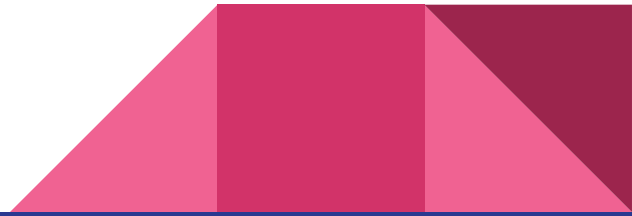
Origins of the FLASH code/center

The FLASH center (originally the Center for Thermonuclear Flashes against compact objects) started about 22 years ago at the University of Chicago with a very narrow purpose, however, as they had access to DOE supercomputers they expanded into other types of simulations and code management

What *is* the FLASH code

The FLASH code is a publicly available high performance application code for plasma physics and astrophysics which has evolved into a modular, extensible software system from a collection of unconnected legacy codes. FLASH consists of inter-operable modules that can be combined to generate different applications.



How does it work?

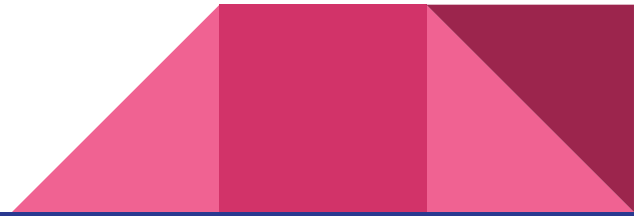
FLASH consists of three main components: solvers, scripts and parameters. The scripts handle parsing parameter files that are either user defined or made by computers into a form that can be handled by the solvers, which then feed the output into other scripts which feed it into other solvers and so on and so forth.

What is it for

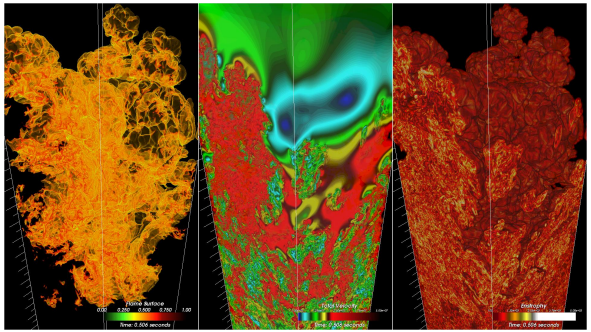
Some recent research that FLASH has been used for include high-energy density physics, thermonuclear-powered supernovae, exascale computing co-design, fluid-structure interactions, and development of implicit solvers for "stiff" systems.

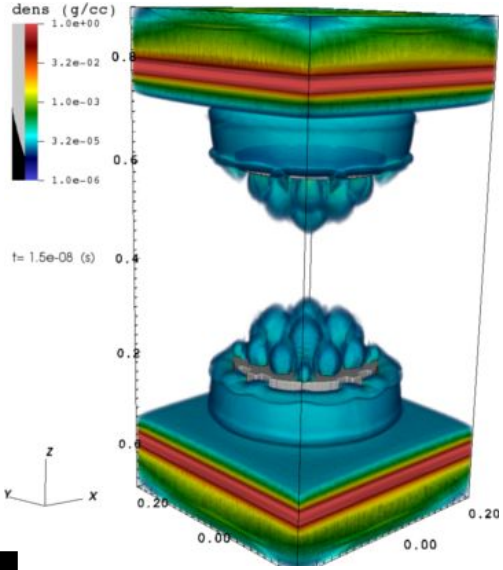
Live code example

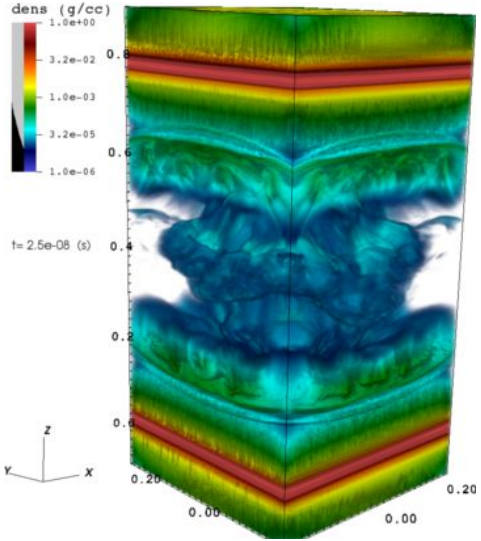
A very basic example of setup to running to plotting

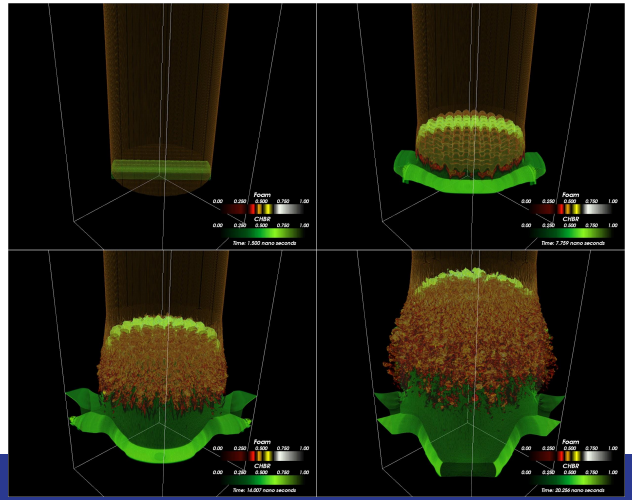


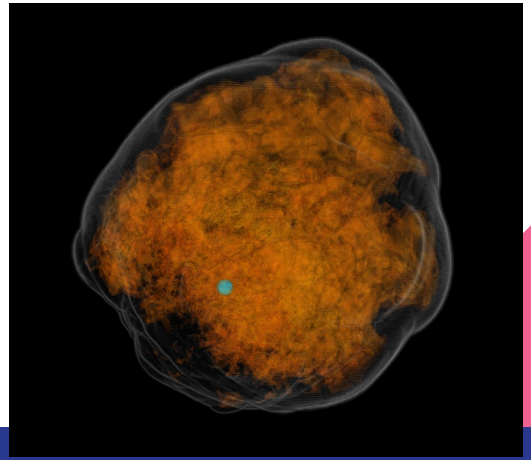
Result examples











Result examples 2

Provides large quantities of frame-by-frame data for animation

http://flash.uchicago.edu/site/movies/

Pros and cons

Pros:

-Versatile
-Accurate
-Flexible
-Scalable
-Large user manual
-Active maintenance, development and network

Cons:

-Technical
-Specific
-Requires permission
-Obtuse legacy code