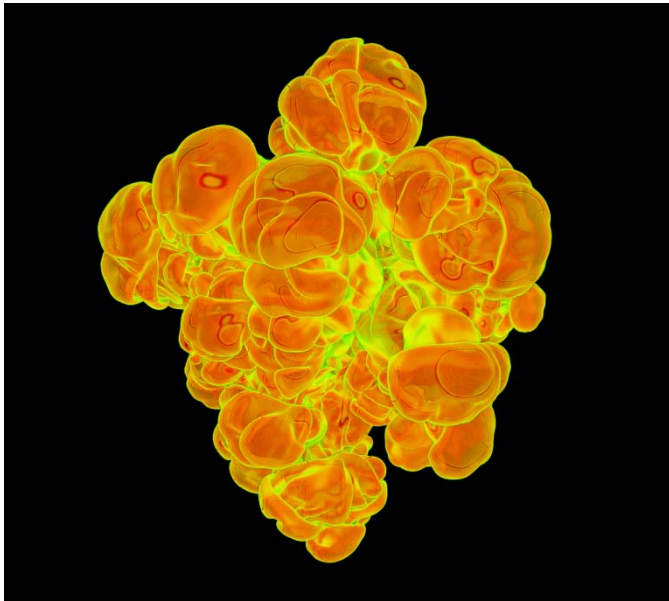


I/O bottlenecks and analysis challenges faced by applications running on leadership systems



Visualization of Type 1A supernova explosion FLASH simulation

- FLASH is multi-scale, multi-physics code used in domains including astrophysics, cosmology and high-energy density physics.
- It uses a block-structured AMR, and at 32K cores, I/O time is about 30% of the entire run achieving a max of 1GB/s out of 35 GB/s on the ALCF Intrepid BG/P system.
- Storage is sometimes referred to as the “black-hole” by FLASH scientists as it significantly impedes the time to glean insights from the simulation.

Improving I/O performance and reducing the time-to-discovery is critical to FLASH. Similar challenges faced by several applications running on DOE leadership systems including PHASTA and HACC.