DETONATION OF A WHITE DWARF STAR:

SIMULATIONS OF THE SUB-CHANDRASEKHAR TYPE IA SUPERNOVAE

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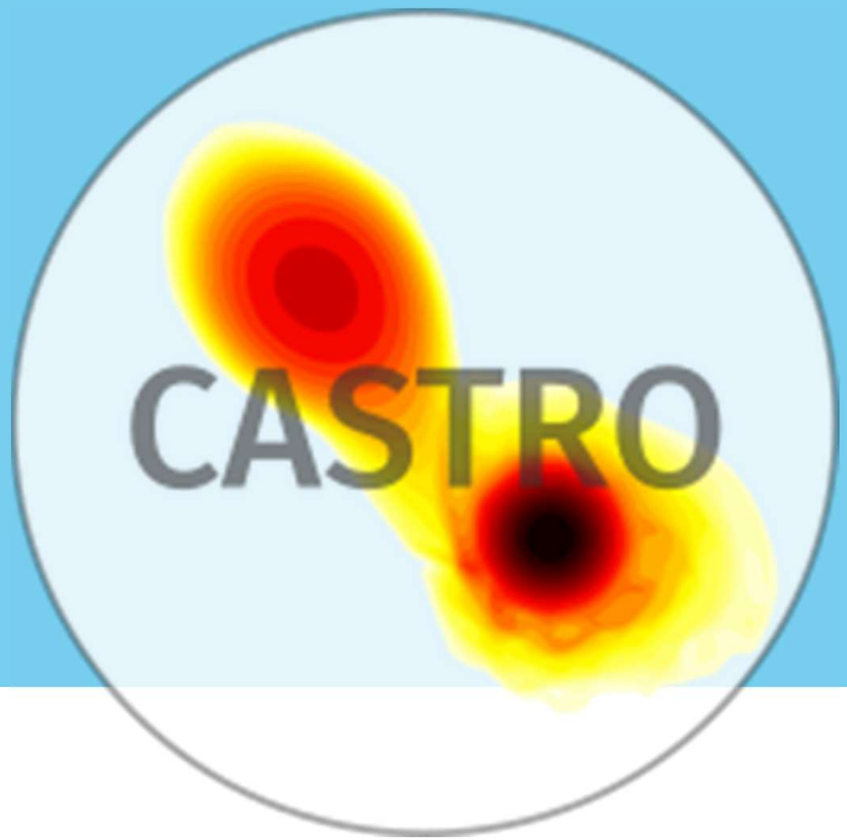
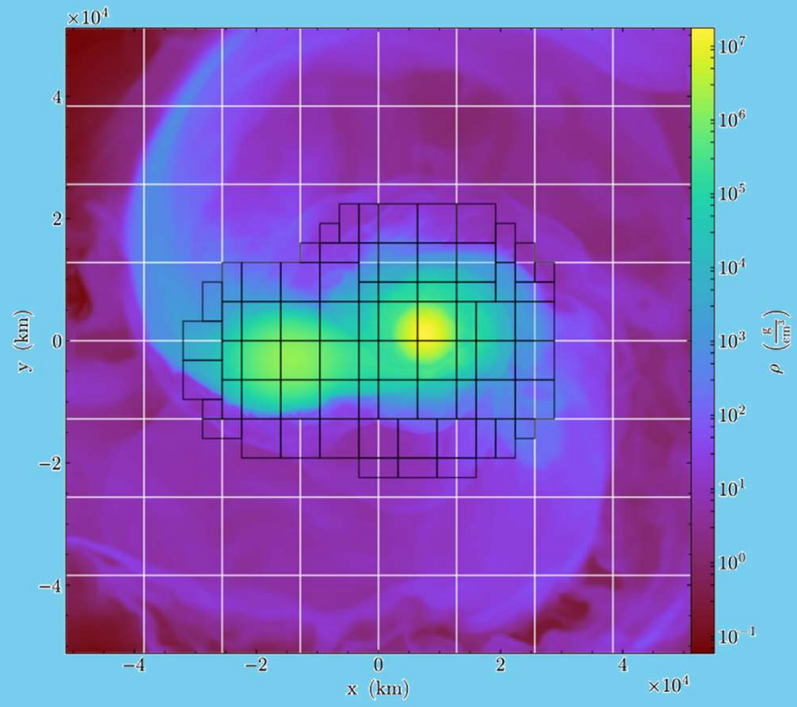
WHITE DWARF BINARY SYSTEM

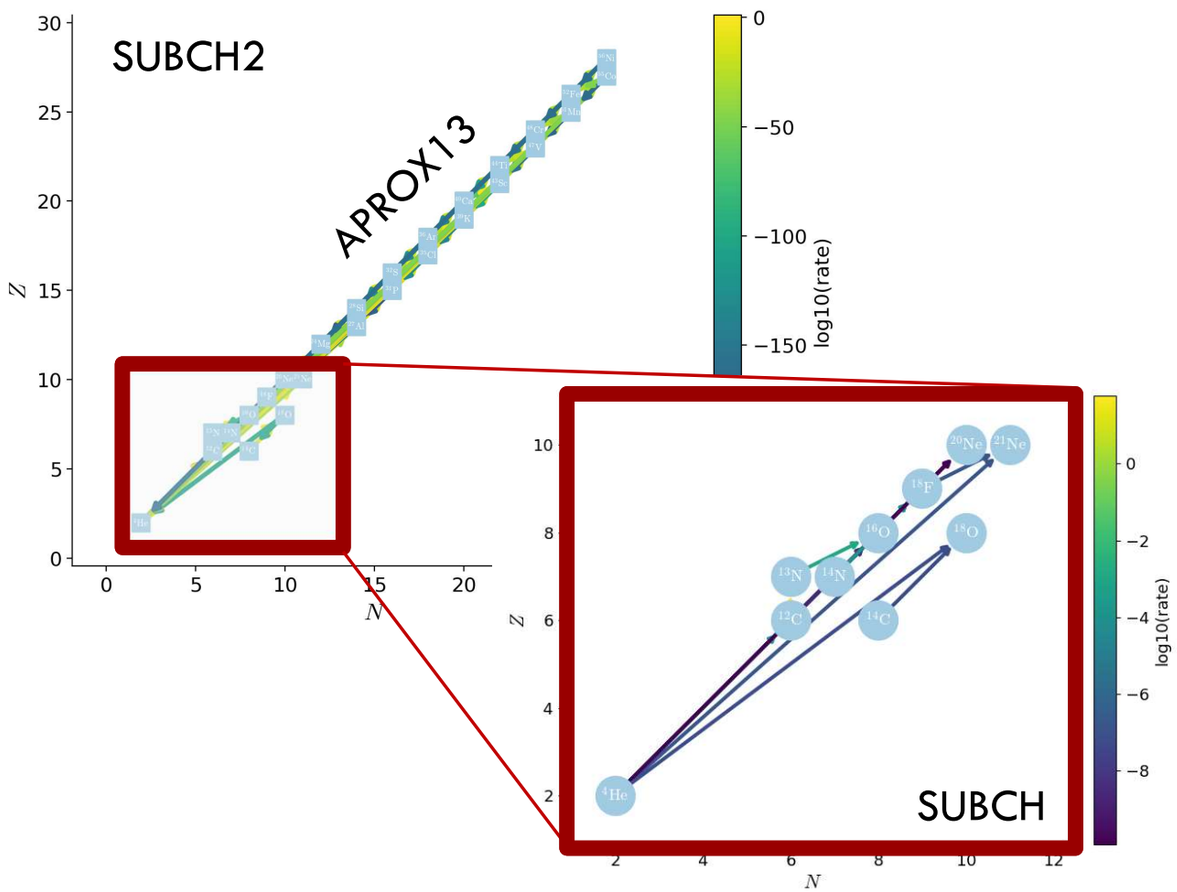




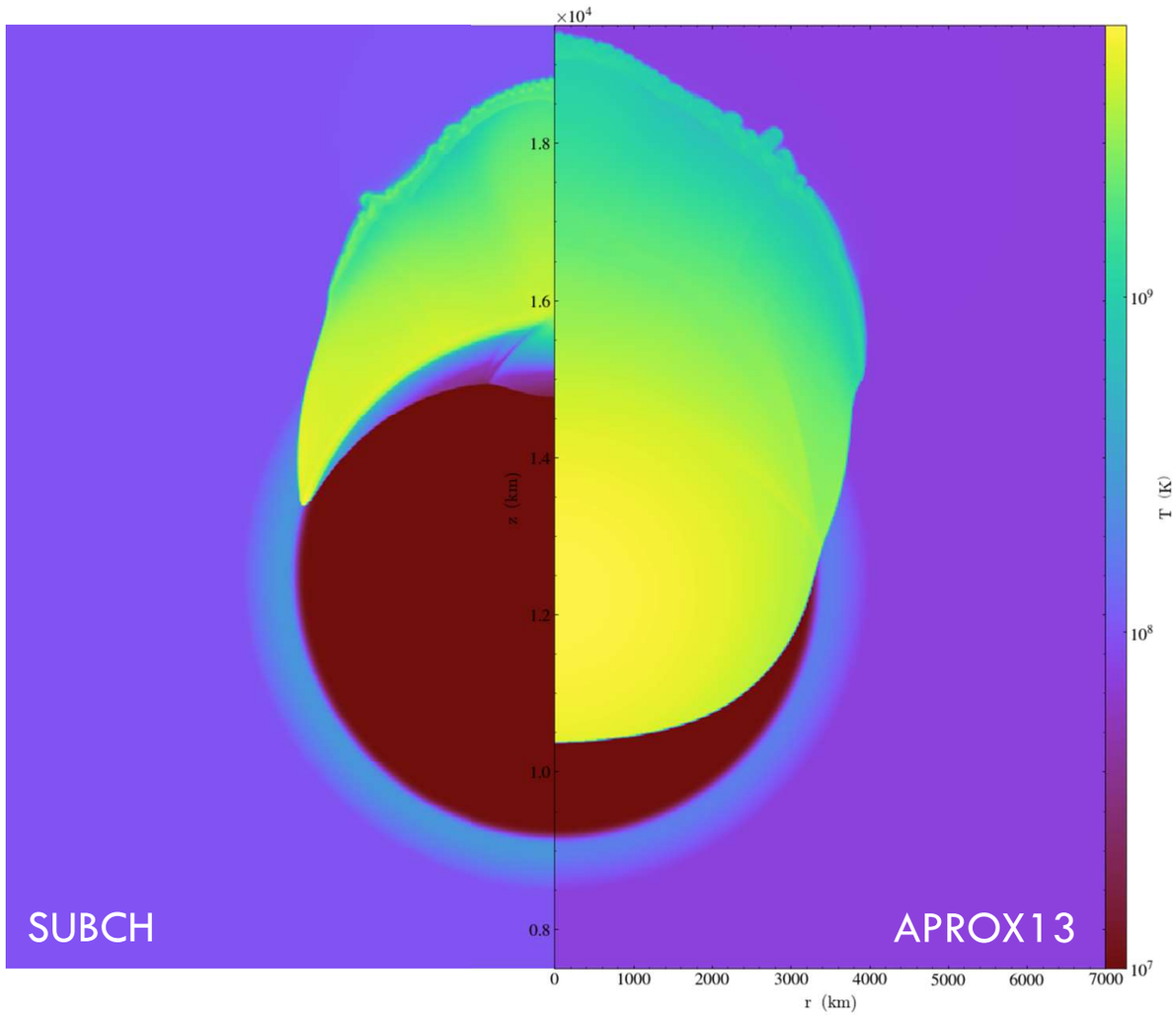
SIMULATION CODE

- Parallelized
- Compressible hydrodynamics
- Adaptive mesh refinement
- Reaction networks
- Open source

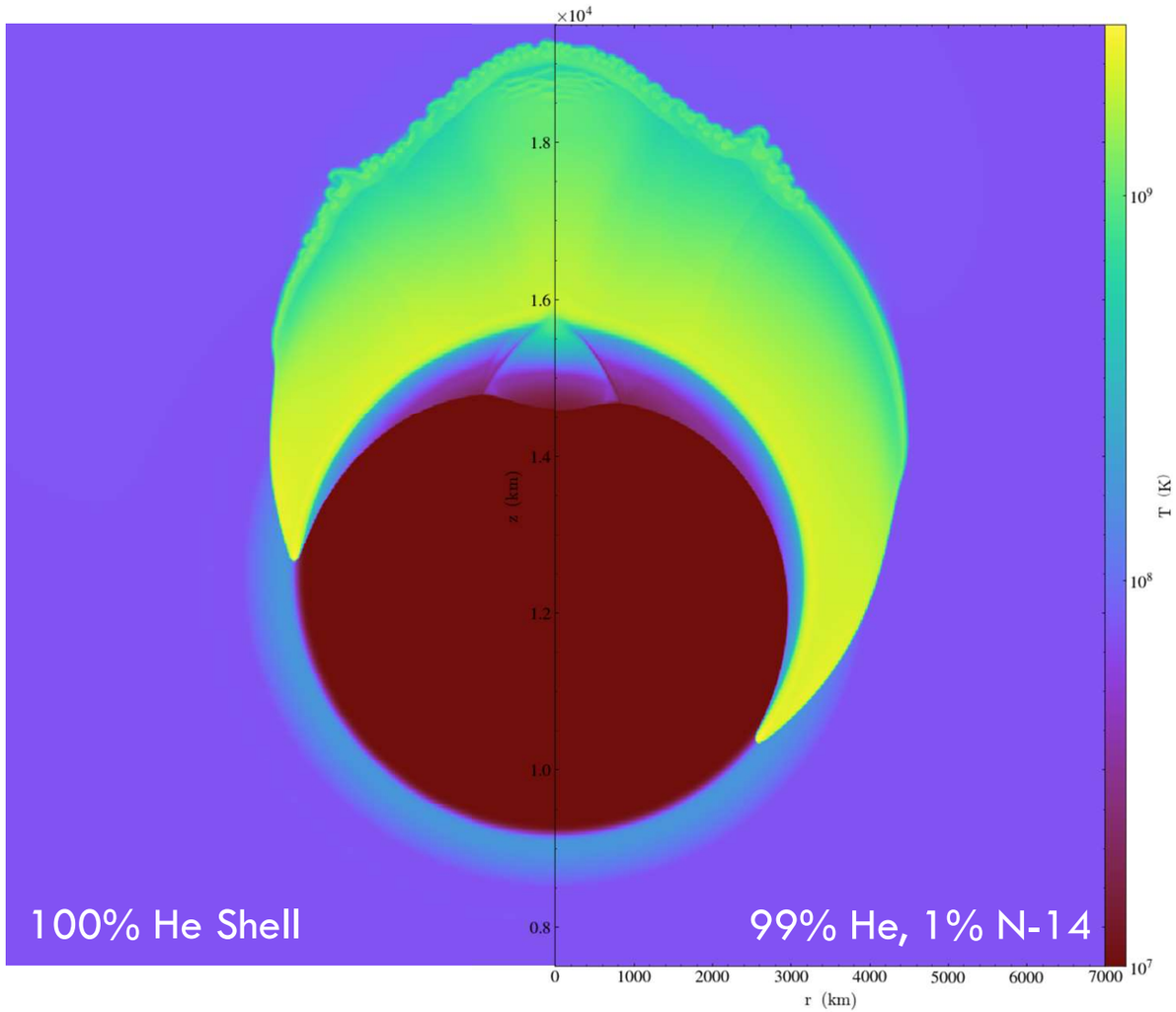
REACTION NETWORKS



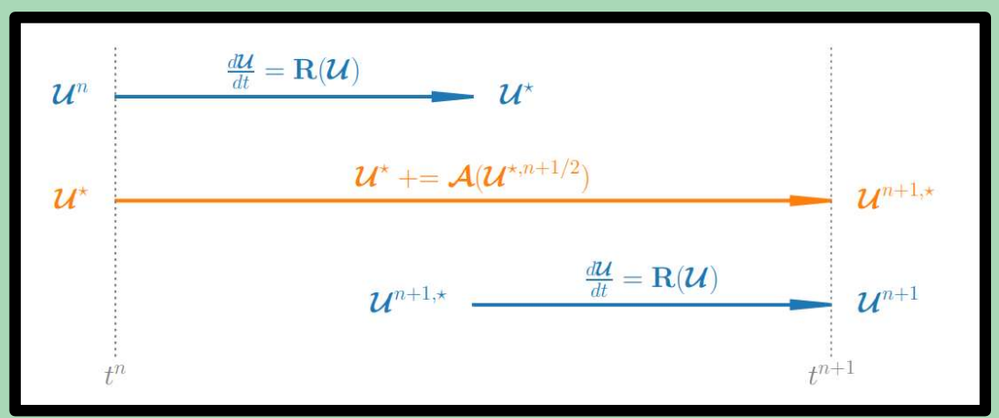
RESULTS: REACTION NETWORKS



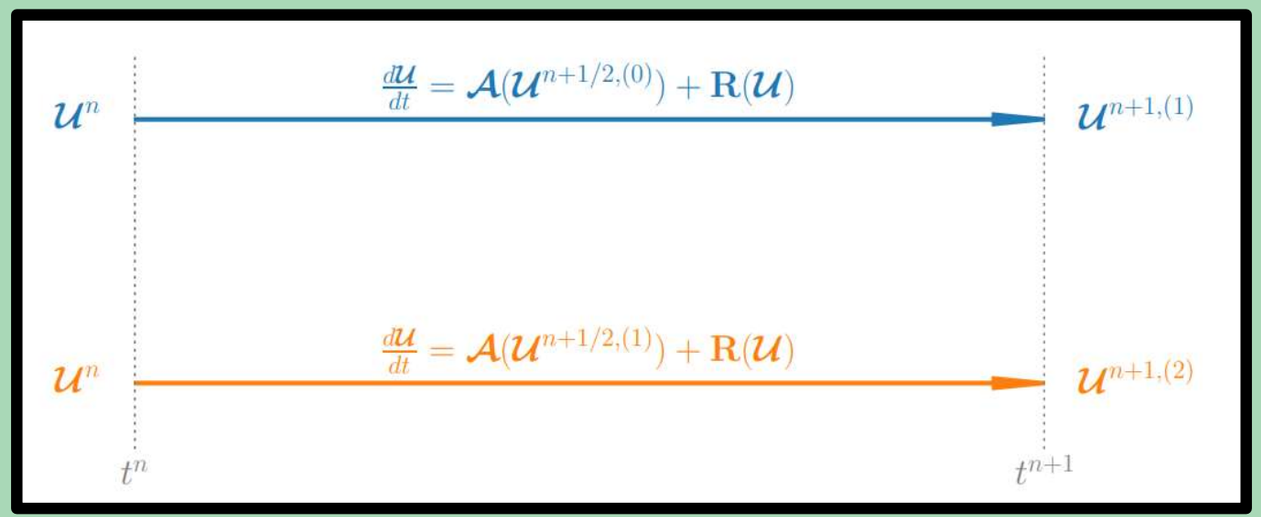
RESULTS: COMPOSITION



DEVELOPMENT: INTEGRATOR



STRANG SPLITTING INTEGRATION



SIMPLIFIED SPECTRAL DEFERRED CORRECTIONS (SDC) INTEGRATION

FURTHER REFERENCES

https://melilly.github.io/projects
For a summary of this ongoing sub-Chandrasekhar project.

https://amrex-astro.github.io/Castro/
For documentation on the Castro magnetohydrodynamics code.

Upcoming paper on SDC integrator: “An Improved Method for Coupling Hydrodynamics with Astrophysical Reaction Networks” by Zingale, et. al.