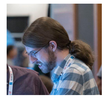
Open source, open science:
Radiative transfer software to interpret time domain and multi-wavelength observations



PRESENTER:
Andrew Fullard

TARDIS is an open-source radiative transfer framework designed to simulate the spectra of astrophysical transients. It is developed by an interdisciplinary team from across the world.

Latest features

- Conda package
- Gamma-ray transport
- *Arepo* model parser
- Continuum interaction opacities
- GPU acceleration to solve the radiative transfer equation

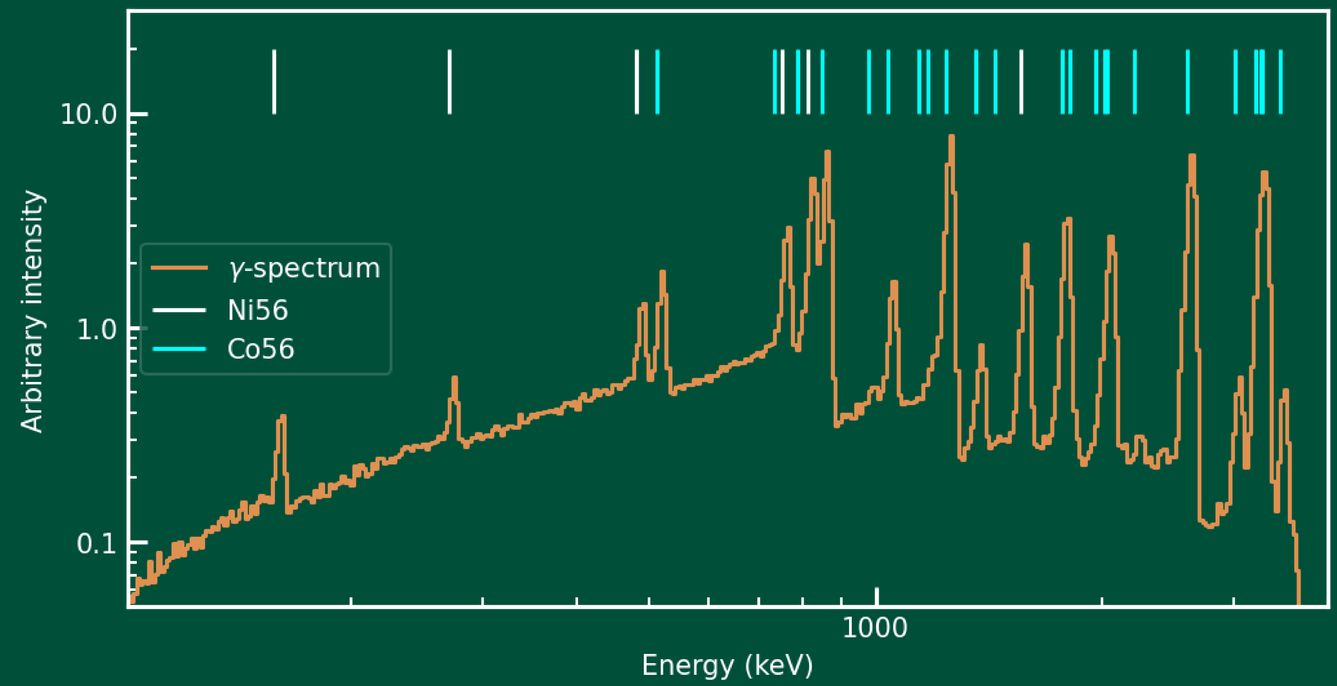
Planned features

- Full NLTE rate equations (all SN)
- Non-homologous expansion (Type II)
- Parsers for additional input models (*STELLA*)
- Nonthermal gamma-ray energy deposition (Type Ia)
- Stellar atmosphere spectra
- 2- and 3-D simulations (all SN)

tardis-sn.github.io

NUMFOCUS
[FISCALLY SPONSORED PROJECT]

The **easy-to-use** TARDIS radiative transfer framework is being **extended** to model the **Type Ia nebular phase**

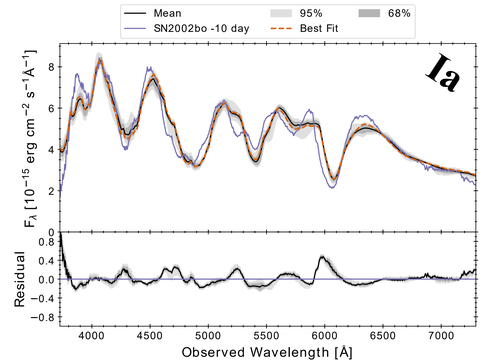


Gamma-ray spectrum generated from the latest TARDIS package as part of the gamma-ray transport for nebular-phase Type Ia simulation

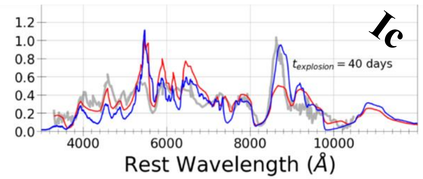
Read the docs

A Fullard is supported by HST-AR-16613.002-A

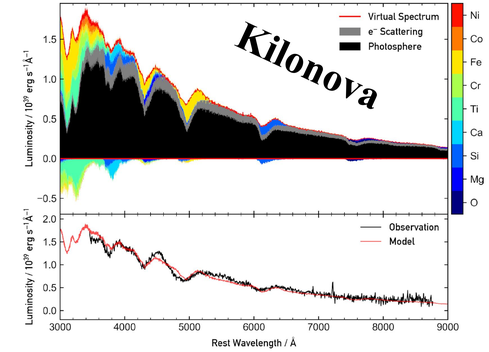
Recent TARDIS results



Probabilistic Reconstruction of Type Ia Supernova SN 2002bo O'Brien+ 2021



Modeling Type Ic Supernovae with TARDIS: Hidden Helium in SN 1994I? Williamson+ 2021



AT2018kzr: the merger of an oxygen–neon white dwarf and a neutron star or black hole Gillanders+ 2020

Andrew Fullard, TARDIS collaboration

MICHIGAN STATE UNIVERSITY