PHOEBE binary star modelling in the era of Kepler and TESS

Authors: David Jones (1,2), Kyle Conroy (3), Martin Horvat (4), Angela Kochoska (3), Joseph Giammarco (5), Herbert Pablo (6), Kelly Hambleton (3) and Andrej Prša (3)

(1) IAC, Spain
(2) ULL, Spain
(3) Villanova University, USA
(4) University of Ljubjana, Slovenia
(5) Eastern University, USA
(6) AAVSO, USA

Go to http://phoebe-project.org/ for more info
Or see Jones et al. (2020, ApJS, 247, 63)

PHOEBE2 (PHysics of Eclipsing BinariEs 2) is an open source binary star modelling code, which reproduces and fits light and radial velocity curves, spectral line profiles and astrometric orbits. The code represents a modern implementation of the Wilson-Devinney code with significant refinements, principally with the aim of providing an open, continuously-developed, robust and high-fidelity tool for the modelling of binary stars in the modern era of ultra-high precision space-based photometry.

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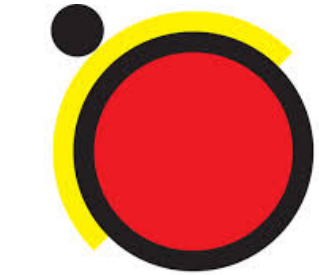
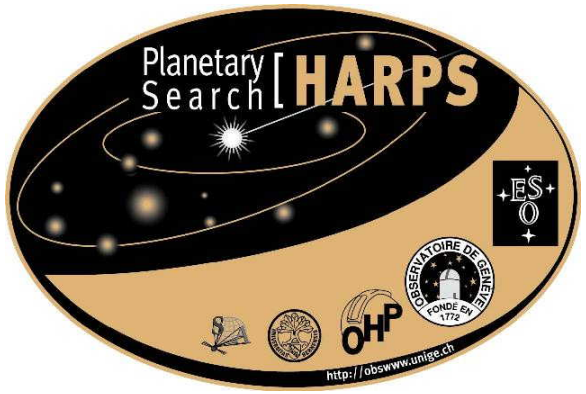
PHOEBE

Thanks to Kepler

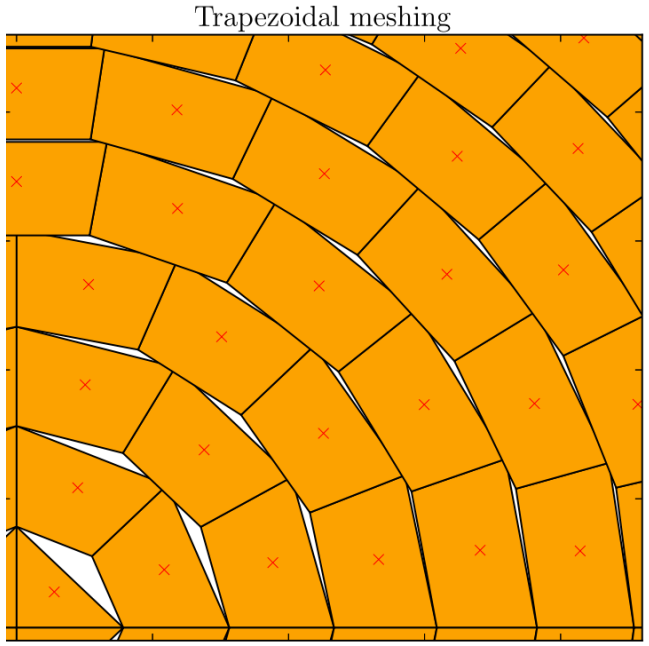


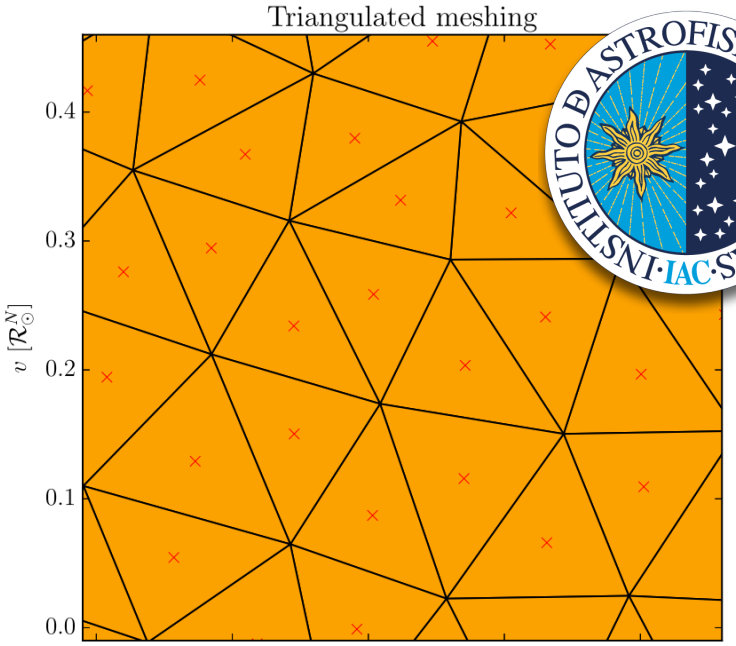


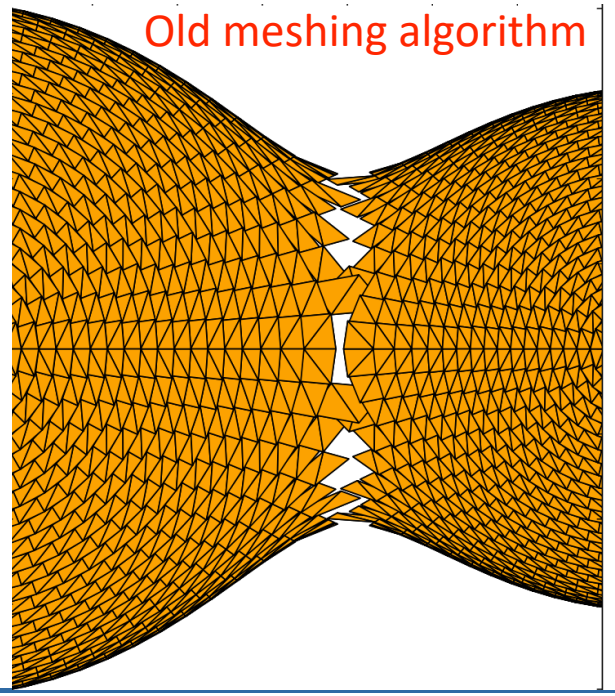
et al., high-precision photometry and radial velocities are now “standard”

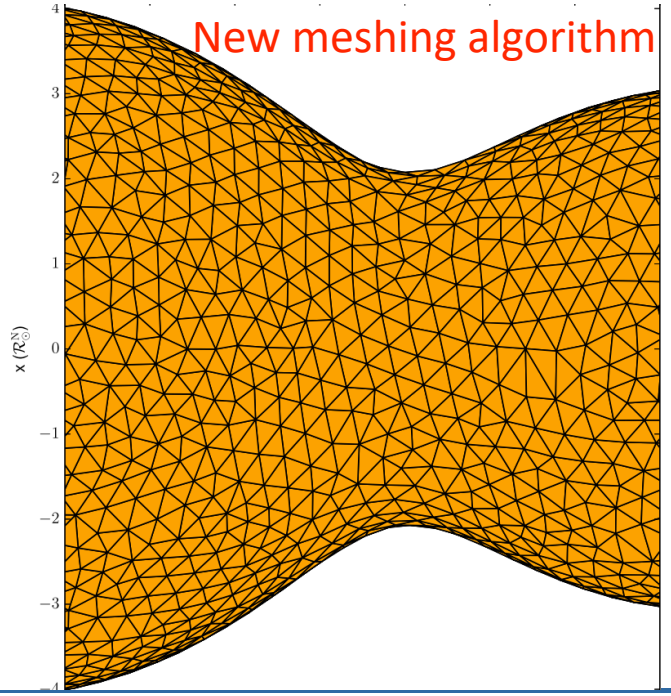
PHOEBE

More advanced modelling codes are needed to take advantage of this data!

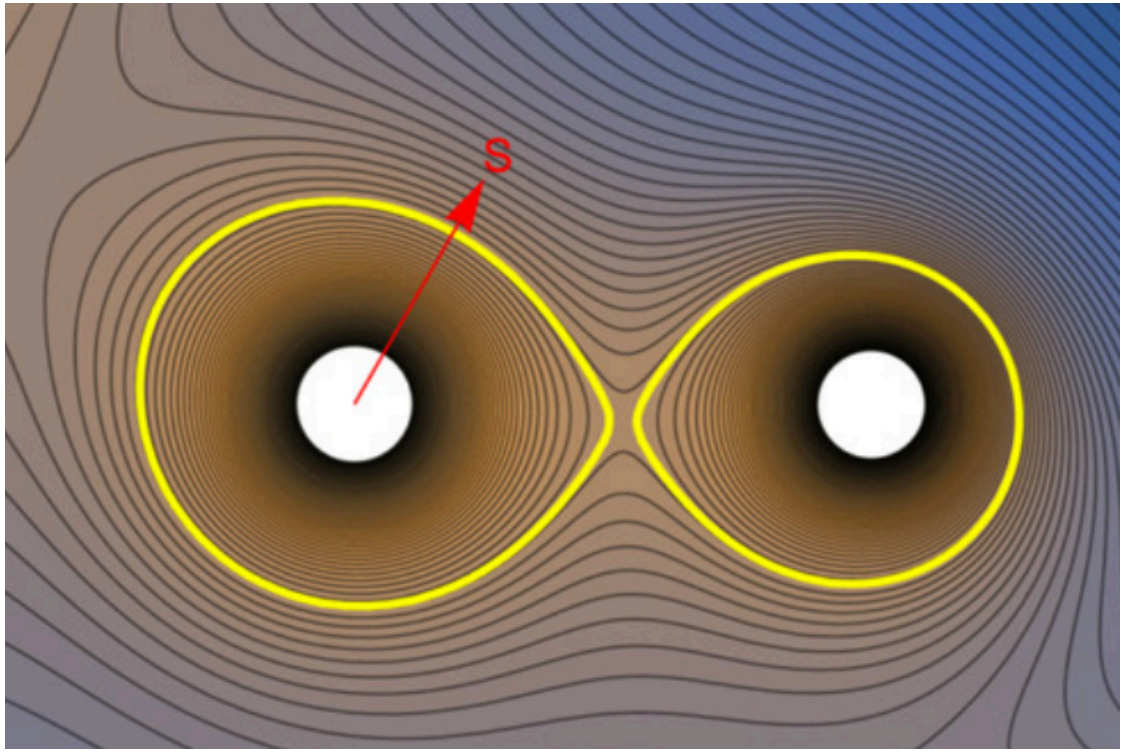




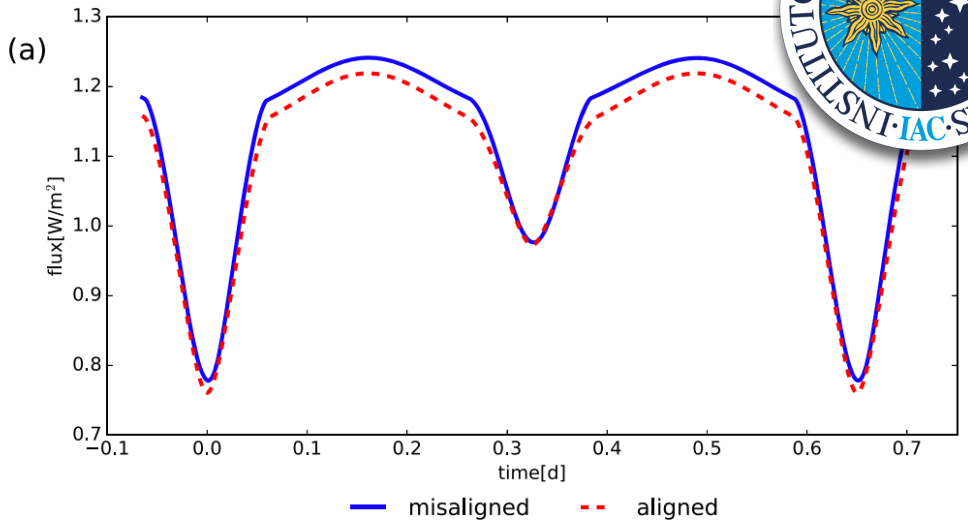


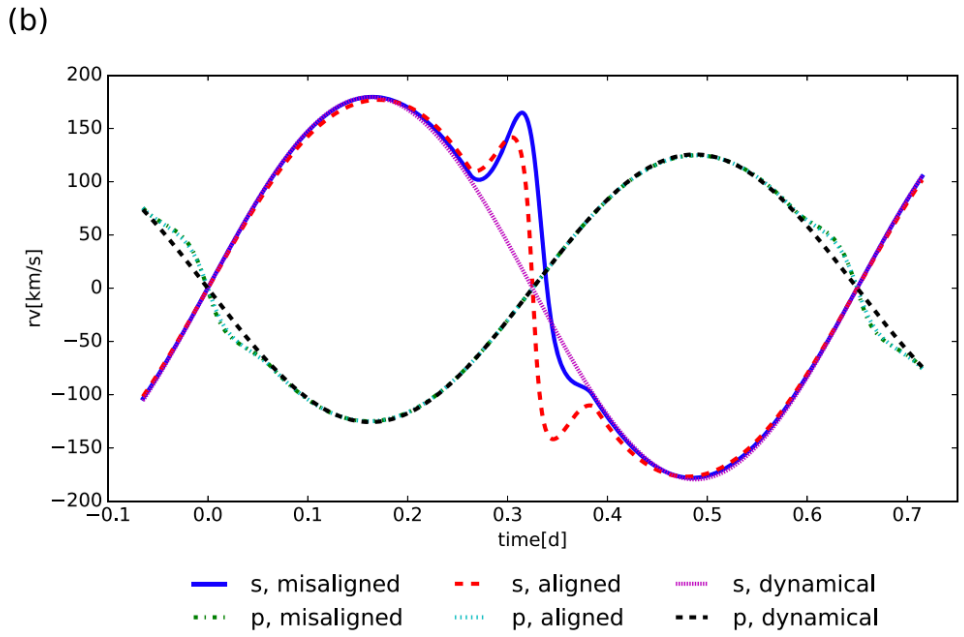


PHOEBE is continually maintained and upgraded to include more advanced physics!



Spin-orbit misalignment [Horvat et al. (2018, ApJS, 237, 26)]





PHOEBE is:

- Delivered as an easy to install python package (can be installed via pip)
- Capable of modelling RVs, light curves, spectral line profiles, astrometric orbits…
- Easily parallelized via MPI
- Already includes lots of advanced physics with more added in every release!

PHOEBE development continues!

- Upcoming releases will include:
  - In-built support for fitting
  - Blended stellar atmospheres
  - Triples
  - Pulsations

Coming in Phoebe v2.3!
Conroy et al. (2020, ApJS, submitted)