Compliance sheet — star-twobody

Everything a supplier qualification, a legal review or an export check usually asks about star-twobody 0.1.0, in one document.

1. Identity

Document	STAR-PKG-STAR-TWOBODY-EN · v2.3 · 2026-11-14
Package	star-twobody
Version	0.1.0
Capability	star.orbit.twobody-quantities
Maturity	Released & Verified (RELEASED)
Python	>=3.9
Source commit	dc09f61d
Source	https://github.com/Andrea07072000/S.T.A.R.-/tree/main/packages/star_twobody

2. Licence and obligations

Apache License 2.0. You may use, copy, modify and distribute it, also commercially, and you receive a patent licence from the contributors. When you redistribute it: keep the LICENSE file and the copyright notices (and a NOTICE file, if a future version adds one), and state in modified files that you changed them. You may not use the S.T.A.R. name to endorse your product.

3. What it needs at run time

Nothing beyond the Python standard library: it works offline.

4. Integrity

SHA-256 fingerprints of the files published on this website. Check a downloaded file with:

```
python -c "import
hashlib,sys;print(hashlib.sha256(open(sys.argv[1],'rb').read()).hexdigest())" star_twobody-
0.1.0-py3-none-any.whl
```

FILE	SHA-256
star_twobody-0.1.0-py3-none-any.whl	991a4eba18e982fd92143c763495addf8af a1d82c02dd6f389b96ebd07d317d7
star_twobody.py	a5fbb4728763581f60553dfc5abfe3fad23 c6a34055d5b8524d68dedfcdc947e
star_twobody-0.1.0-source.zip	cdd096b7a470bb07de3ee29982c145acf4c 7288b0051b39875dae44eee83214d

5. What it does, and its limits

Period, mean motion, circular and escape speed, apsis radii and speeds and specific energy of a two-body ellipse; within 4e-14 relative of SPICE for any gravitational parameter and 2.6e-14 of hapsira on 600 orbits; reproduces the geostationary orbit and refuses non-elliptic input.

Two-body motion only: the real period of a low orbit differs by seconds because of the Earth's oblateness (see `star_j2` for the nodal period). Ellipses only: no parabolic or hyperbolic orbits. No position along the orbit (see `star_kepler`) and no manoeuvres (see `star_maneuver`). The result is as good as the mu supplied.

- `period`, `semi_major_axis_from_period`, `mean_motion`: Kepler's third law, for the Earth by default or any mu. Reproduce the geostationary orbit (one sidereal day at 42164.17 km).
- `circular_speed`, `escape_speed`, `apsides`, `elements_from_apsides`, `apsis_speeds`, `specific_energy`, consistent with each other: angular momentum and energy are the same at the two apsides.
- Measured on 600 orbits (a 6600 to 400000 km, e 0 to 0.95, 100 circular): within 4e-14 relative of SPICE for a gravitational parameter from the Moon's to the Sun's, and within 2.6e-14 of hapsira on the Earth.
- Every function returns finite floats or raises `ValueError`: non-numeric, boolean, NaN or infinite input, a length, period or mu outside [1e-30, 1e30] (zero and negative values included), an eccentricity outside [0, 1), an apoapsis below the periapsis by more than rounding.

6. Export, use and certification

The package is published and freely available. That usually takes software out of export-control lists, but not every use of it: read the page on space activities and export control before using it in a controlled programme. It is not certified or qualified for flight; the evidence describes what was tested and how.

7. Citation and bill of materials

```
@software{cavazzini_star_twobody_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-twobody}: The sizes and speeds of a Keplerian ellipse},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_twobody/},
  note    = {Apache-2.0. Source: https://github.com/Andrea07072000/S.T.A.R.-, commit dc09f61d}
}
```

CITATION.cff · BibTeX · SBOM CycloneDX 1.5 · SBOM SPDX 2.3

8. Warranty and liability

Provided "as is", without warranties or conditions of any kind (Apache License 2.0, sections 7 and 8), to the extent the law allows. This never excludes liability that the law does not allow to exclude.

Related: space activities and export control · acceptable use · evidence and limits · licence texts