Compliance sheet — star-ecliptic

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

1. Identity

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

2. Licence and obligations

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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_ecliptic-
0.1.0-py3-none-any.whl
```

FILE	SHA-256
star_ecliptic-0.1.0-py3-none-any.whl	4dcb673fda3843e16db5e7b265b582ff449d44783b608c3fac94b96b3ab176d6
star_ecliptic.py	6ce870a4af69d5fba1bd955150b5c1418b82bc66a818f61237291fd749d70d6e
star_ecliptic-0.1.0-source.zip	8824cd9f464b435f5efd9c5b1f77b8563f60446f18b54242aa8f09e830c81290

5. What it does, and its limits

Mean obliquity of the ecliptic (IAU 2006 and IAU 1980) and conversion of directions between equatorial and ecliptic frames; agrees with ERFA, astropy and SPICE to 1.1e-13 deg and with ERFA and skyfield to 1.5e-11 arcsec on 600 cases, and refuses out-of-range input.

Mean obliquity only: no nutation (pass a true obliquity if you have one). No precession: the directions stay referred to the equinox they were given in. The IAU 1980 polynomial is compared with one library (ERFA) and one published example, not two libraries. At a pole of the target frame the longitude is undefined and the value returned there is arbitrary (within [0, 360)). The time argument is TT; using UTC instead changes the result by less than 1e-6 arcsec.

- `mean_obliquity_arcsec(jd_day, jd_frac, model)` evaluates the IAU 2006 (default) or IAU 1980 polynomial in TT Julian centuries from J2000.0, with the date split in day and fraction. Reproduces Meeus Example 22.a.
- `equatorial_to_ecliptic` and `ecliptic_to_equatorial` are one rotation about the equinox by the obliquity passed by the caller, and are inverse of each other; longitudes out are in [0, 360). Reproduce Meeus Example 13.a.
- Measured on 600 cases (dates 1800–2200, 100 directions down to 1e-6 deg from the pole of the ecliptic): directions within 1.1e-13 deg of ERFA, astropy and SPICE; IAU 2006 obliquity within 1.5e-11 arcsec of ERFA and skyfield; IAU 1980 obliquity within 1.5e-11 arcsec of ERFA.
- Every function returns finite floats or raises `ValueError`: non-numeric, boolean, NaN or infinite input, a date outside JD 2086302.5 … 2816787.5 (years 1000–3000), a fraction outside [-1, 1], an unknown model, declination or latitude outside [-90, 90], right ascension or longitude outside [-360, 360], obliquity outside [0, 324000] arcsec.

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_ecliptic_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-ecliptic}: Mean obliquity and equatorial ⇄ ecliptic directions},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_ecliptic/},
  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

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