Compliance sheet — star-interp

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

1. Identity

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

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

FILE	SHA-256
star_interp-0.1.0-py3-none-any.whl	d22a442ef7847297ec6fec1ee55462e9bb5cb72de73dcbab7a2fc68a08142e51
star_interp.py	11c6ad197ef4621720a7ce1ed8c0464b407f6b9fedcdae92ec7c361063a96e7c
star_interp-0.1.0-source.zip	6b4beef182e8b83cc46b154fcfbf6ab431c4457f569715e2f1ec99610c319258

5. What it does, and its limits

Value and first derivative of the interpolating polynomial through 2 to 20 tabulated points, in barycentric form; within 7e-15 of exact rational arithmetic on 600 tables, closer to the exact value than SciPy (1.2e-14) and NumPy (7e-11) on the same tables; extrapolation refused.

The accuracy stated is that of evaluating the polynomial, NOT of the interpolation: how well a polynomial through n points represents an orbit depends on the spacing, the degree and where in the table x falls (the central interval is the reliable one), and is the caller's to assess. No extrapolation, no Hermite interpolation (positions with velocities), no splines, scalars only (interpolate each coordinate separately). With many points far from equally spaced the polynomial itself oscillates; that is a property of the method, not checked here.

- `lagrange(xs, ys, x)`: the polynomial of degree len(xs) – 1 through the points, in barycentric form; nodes in any order and any spacing; at a node the tabulated value is returned exactly. Reproduces Meeus Example 3.a.
- `lagrange_derivative(xs, ys, x)`: its first derivative, also at the nodes; `lagrange_weights(xs)`: the weights.
- Measured on 600 tables of 2 to 11 jittered, unsorted nodes against EXACT rational arithmetic (SymPy): value within 7e-15 of the exact polynomial, relative to the largest tabulated value; derivative within 1e-13 (scaled). On the same tables SciPy's barycentric interpolator is within 1.2e-14 of the exact value and a NumPy polynomial fit within 7e-11.
- Every function returns a finite float or raises `ValueError`: fewer than 2 or more than 20 points, lengths that differ, equal nodes, any non-finite or non-numeric element (booleans included), an x outside the range of the nodes (extrapolation is refused), nodes whose weights overflow.

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_interp_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-interp}: Lagrange interpolation through tabulated points},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_interp/},
  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