Compliance sheet — star-topo

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

1. Identity

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

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

FILE	SHA-256
star_topo-0.1.0-py3-none-any.whl	856f372a906de75dd39c49467effde8c0645b82f55f98b122be25ced10531df2
star_topo.py	be903fb27e97c2d5af06ab735e80b304d7065ef77237584e1fddcb667ebdc6b3
star_topo-0.1.0-source.zip	37441eec1aa767d528209cd254e432124320d5328db45f0630c36d92def8673c

5. What it does, and its limits

ECEF to/from local East-North-Up and azimuth/elevation/range at a WGS-84 site: the geometry of ground-station visibility. Every function returns three finite floats or raises ValueError.

Geometry only: no atmospheric refraction, no light-time, no Earth rotation during signal travel, no terrain mask. The target must already be in the same Earth-fixed frame as the site.

- `ecef_to_enu` / `enu_to_ecef`: East, North, Up in metres at a site given by geodetic latitude, longitude (deg) and ellipsoidal height (m) on WGS-84; "up" is the ellipsoid normal. Reproduces the EPSG Guidance Note 7-2 example (method 9836) to the printed millimetre.
- `enu_to_aer` / `aer_to_enu`: azimuth from North towards East in [0, 360), elevation from the horizontal plane in [-90, 90], range in metres. At the zenith or nadir the azimuth is returned as 0.0.
- `ecef_to_aer` / `aer_to_ecef` compose the two; a round trip returns the starting point and the range equals the ECEF distance between site and target.
- Every function returns three finite floats or raises `ValueError`: non-numeric, boolean, NaN, infinite or |value| >= 1e300 input; latitude or elevation outside [-90, 90]; longitude or azimuth outside [-360, 360]; site height at or below -b (the Earth's centre under the poles); zero or negative range; target on the site; 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_topo_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-topo}: Look angles from a ground site},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_topo/},
  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