

Plan your nights with the SSI Session Planner

The tool that finds the best astrophotography targets of the night for your location and your equipment — with scores, exposure times, framing and exports to your sequencer.

Product: **StellarSkyImager · Session Planner** Audience: **end users** Language: **English** Access: **web, free**

About this guide

This document describes the Planner as it appears on screen, without going into the internal calculations (covered in the technical documentation). PDF export: *"Print / Export to PDF"* button, then *"Save as PDF"*. A dedicated guide exists for SSI Sentinel, the GO/NO-GO monitoring service that extends the Planner.

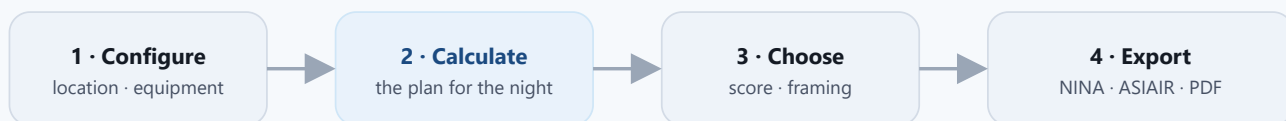
CONTENTS

- | | |
|--------------------------------------|--|
| 1. What is the Planner? | 7. Running the calculation & the condition cards |
| 2. Getting started: Simple or Expert | 8. The target cards |
| 3. Setting up the session | 9. Details: finder & framing |
| 4. Your equipment | 10. Advanced modes |
| 5. Catalogues & spectral filtering | 11. Custom targets |
| 6. Your personal horizon | 12. Exports & sharing |

1. What is the Planner?

The **SSI Session Planner** helps you prepare your astrophotography sessions by suggesting the **best observable targets** for your equipment, your location and the conditions of the night. It combines object visibility, sky quality (light pollution), the Moon and the weather, then ranks targets by an **"imageability" score** and suggests exposure times suited to your setup.

The web Planner is **free, with no account and no advertising**.



The typical workflow: set your location and equipment, calculate the plan, choose your targets, export to your sequencer.

2. Getting started: Simple or Expert

The Planner offers two levels of display, switchable at the top of the configuration panel:

MODE	FOR WHOM
Simple Mode	The essentials to get started — location, equipment, targets.
Expert Mode	Access to every setting: personal horizon, altitude threshold, multi-filter mode, sequence mode, mosaic mode...

All configuration happens in the **left-hand panel**. Once it is ready, the **“Calculate plan”** button runs the analysis and displays the targets on the right.

3. Setting up the session

Observing location

Tell the Planner where you observe from. Three ways:

- **By city** — type the name (e.g. “Mougins, France”) and pick a suggestion;
- **By GPS** — the “*My location*” button locates you automatically;
- **By coordinates** — direct entry (decimal or DMS).

The Planner then displays your coordinates, your **time zone** and an estimate of the **light pollution (Bortle index)**.

Lieu d'observation

Villard-de-Lans

Bortle 3

Bortle estimé selon votre position. Cliquez pour ajuster manuellement.

45° 4' 14.2" N, 5° 33' 4.6" E (45.0706, 5.5513)

Europe/Paris (UTC+2:00)

ALTITUDE DU SITE

ex : 250

m

DATE ET HEURE DE DÉBUT

15/09/2026 21:00

DURÉE DE SESSION VISÉE

4 heures

The "Observing site" block: the Bortle value is estimated from the position and stays adjustable by hand.

The Bortle index (light pollution)

The Bortle scale (1 to 9) rates the quality of the night sky. The displayed value is **estimated automatically** from **VIIRS** satellite data (NASA/NOAA), which measures sky brightness as seen from space.

Bortle 1–3	Excellent to rural sky. Milky Way visible.
Bortle 4–5	Transition. Good for deep sky.
Bortle 6–7	Suburban. Filters recommended.
Bortle 8–9	Urban. Filters essential.

Adjusting the Bortle value by hand

The satellite estimate can be inaccurate (e.g. a cloudy sky when the satellite passed over). You can switch to **manual estimation** to enter your own value — for instance if you know the actual SQM of your site.

Date, time & duration

Choose the **date** (the positions of celestial objects change every night), the **start time**, and the **target session duration** (2 h, 3 h, 4 h, 6 h, or all night). The **site altitude** can also be entered: it improves atmospheric transparency and reduces turbulence.

Max Targets

This setting fixes the **length of the results list**: from 1 to **200** targets (1, 2, 3, 5, 10, 20, 50, 75, 100, 150, 200), **50 by default**.

Since targets are ranked by score, raising the limit **extends the list towards the bottom of the ranking**: the first cards stay the same. Going up to 200 is therefore about exploring widely, not about improving the top of the list.

In **sequence mode**, this setting is locked at 200: all available targets are loaded to ensure consistent score-based ranking.

The cost is in the rendering

200 targets means 200 cards to draw. On a phone or a modest machine, the list takes noticeably longer to appear: **50** remains the best everyday compromise.

4. Your equipment

This is the decisive step: the physical dimensions of your sensor and your focal length set your **true field of view (FOV)**, and therefore which targets actually "fit" in the image.

Presets, the easiest way

Rather than entering everything by hand, use the **presets**:

- **Camera presets** — ZWO ASI, QHYCCD, Player One, SVBony, Atik, Moravian, Altair, DSLR...
Selecting one automatically configures the sensor (pixel size, dimensions).
- **Instrument presets (smart telescopes)** — ZWO Seestar, Dwarf, Vaonis Vespera, Celestron Origin, Unistellar...: sensor *and* focal length, aperture and tracking are all set in one go.

The settings in detail

SETTING	ROLE
Focal length (mm)	Focal length of the optics — determines magnification.
Aperture (mm) & f/ratio	The f/ratio indicates optical “speed”: an f/5 collects light faster than an f/10.
Pixel size (μm) & sensor	Set the sampling and the FOV (APS-C, full frame, Micro 4/3, 1”, or custom dimensions).
Binning	1×1 (native) to 4×4 (super-pixels) — groups pixels together to gain sensitivity.
Filter	No filter, L-Pro, L-eXtreme (dual-band), L-eNhance (tri-band), Hα, OIII, SII, Luminance, RGB.
Tracking mode	Fixed (tripod), Star Tracker, Advanced tracking (autoguiding), or Dobson / Alt-Az.

Equipment profiles

Save your favourite setups as **profiles** (“Save” button) to reload them in one click from one session to the next.

↪ **Link with SSI Sentinel.** This same equipment can be *synchronised to your account* and reused by the Sentinel monitoring service. See “Setting up your watch” in the Sentinel guide.

5. Catalogues & spectral filtering

Object types & catalogues

Choose the **target types** you are interested in — **Nebulae** (M42, IC 1805...), **Galaxies** (M31, M101...), **Clusters** (M45, M13...) — and the **catalogues** to query:

Messier · NGC · IC · Sharpless (Sh2) · Arp · Abell PN · HASH · SNR (supernova remnants).

Spectral filtering (Hα, OIII, SII)

For your narrowband projects (SHO palette), you can **prioritise nebulae** emitting at specific wavelengths:

Hα · 656 nm

OIII · 501 nm

SII · 672 nm

- **Hα (red)** — Hydrogen alpha, typical of diffuse nebulae and supernova remnants;

- **OIII (cyan)** — Ionised oxygen, ubiquitous in planetary nebulae;
- **SII (orange)** — Ionised sulphur, essential to the SHO (Hubble) palette.

Effect on the ranking

Selecting these emission lines grants a **+20 point bonus** to matching targets, pushing them up in your recommendations. Galaxies and clusters remain visible if their natural score is excellent.

Sky region

You can restrict the search to a **cardinal direction** (N, NE, E, SE, S, SW, W, NW) — useful if part of your sky is clear and the rest is obstructed.

6. Your personal horizon

Every site is unique: roofs, trees, terrain and buildings hide part of the sky. Without that information, visibility calculations are misleading. The Planner can take **your real horizon** into account.

Importing a horizon profile

In **Expert Mode**, import a horizon file (from NINA, Cartes du Ciel...). Accepted formats: `.hrz`, `.txt`, `.csv`, `.rtf`.

- One line per point: **azimuth then altitude**, in degrees, separated by a space, comma or semicolon;
- Azimuth from **0° to 359°** (North = 0°, clockwise); altitude from **0° to 90°**;
- At least **3 valid points**; lines starting with `#` or `//` are ignored (comments).

Once active, the profile is drawn **as an overlay** on the polar graph and on the target paths; objects whose entire observing window is obstructed are **penalised** in the ranking.

No file? The Horizon Generator

The **Personal Horizon Generator** tool (*Horizon Generator* menu, `/horizon-generator` page) lets you model your horizon **visually**, with no file:

- 1 Start from a **preset profile** (Clear horizon, City, Valley / Hills) or import an existing `.hrz`.
- 2 **Drag the 36 horizon points** (one every 10°): towards the centre to raise the altitude of an obstacle, towards the edge to lower it. Useful references: two storeys $\approx 6^\circ$, roof ridge $\approx 15^\circ$, hill $\approx 20^\circ$, mountain $\approx 35^\circ$. A **brush mode** and an **eraser** speed up the work.
- 3 **Export to** `.hrz` (compatible with NINA, Cartes du Ciel) or **send it straight to the Planner**.

A “ceiling” (overhead obstacle) can also be set; it is specific to SSI and will be ignored by other software.

↪ **Link with SSI Sentinel.** The horizon profile can be attached to an *observing site* in your account to refine GO/NO-GO verdicts. See the Sentinel guide.

7. Running the calculation & the condition cards

Click **“Calculate plan”**. The Planner analyses the night and displays, at the top of the results, three **condition cards**:

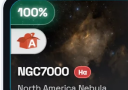
Darkness	Length of astronomical night (Sun at -18° below the horizon), with start and end times.
Weather	Forecast cloud cover, wind and seeing (atmospheric stability).
Moon	Phase, illumination percentage and rise / set times.

Nautical night in summer
At high latitudes ($\approx 49^\circ$ and above), in summer, the Sun may never drop below -18° : there is no astronomical night. The Planner then automatically falls back to **nautical night** (Sun below -12°), flagged by a banner. Imaging is still possible; narrowband filters (H α /OIII/SII) are recommended because the sky background stays brighter than during true darkness.

8. The target cards

Each recommended target is shown as a **card**, sorted by relevance. You can sort the list by **Score**, **Size**, **Magnitude**, **Altitude** or **Transit**.

100%



NGC7000
North America Nebula

Région HII

28h59m17s +44°31'44" (2000)

★ Cygne

Mag: 4

Fenêtre: 21:00-01:00

Taille: 120"

↕ 2.55"x1.71"

COMFORT

96x1min

AMBITIEUX

77x2m38s

3x13

17h

23h

5h

TRANSIT (MAX)

89.33° • 216.70° (SW)

22:59

✓ 2026

FACILE

100%



M39

Amas ouvert

21h31m48s +48°28'16" (2000)

★ Cygne

Mag: 4.6

Fenêtre: 21:00-01:00

Taille: 20"

↕ 2.55"x1.71"

COMFORT

96x1min

AMBITIEUX

77x2m38s

3x13

17h

23h

5h

TRANSIT (MAX)

86.63° • 0.50° (N)

23:30

42%

FACILE

100%



NGC7243

Amas ouvert

22h15m08s +49°53'52" (2000)

★ Lézard

Mag: 6.4

Fenêtre: 21:00-01:00

Taille: 15"

↕ 2.55"x1.71"

COMFORT

96x1min

AMBITIEUX

77x2m38s

3x13

17h

23h

5h

TRANSIT (MAX)

84.91° • 17.51° (N)

00:09

Bulle

FACILE

Three target cards. The first two carry a **Sentinel badge** — a completed project, then a project in progress; the third, with no project, keeps its “Track this target” button. The badges are detailed below.

What a card tells you

- **The score (0–100)** — an “imageability” indicator combining altitude, surface brightness, size relative to your sensor, the Moon and the Bortle index. It translates into a difficulty: Easy Medium Hard.
- **Max altitude & transit** — the highest point reached and the time of meridian crossing (as well as the meridian flip for equatorial mounts).
- **Window** — the optimal time slot for imaging the target.
- **Exposure time** — two suggestions matched to your equipment: **Comfort** and **Ambitious**, with the number of sub-exposures and the total time.
- **Recommended filter**, an **AstroBin** link (to see images of the target), and a **“Track this target”** button.

↪ **The “Track this target” button.** It creates a *multi-night tracking project* in SSI Sentinel, so you get an alert on every evening the target becomes observable. Details in “Tracking a target” in the Sentinel guide.

The Sentinel badges

If you track a target with **SSI Sentinel**, its card carries a small **status badge** in the top right. It only appears for a **signed-in** account that has a project on that target; otherwise the card shows the **“Track this target”** button instead.

	In progress — the percentage is the integration already acquired, relative to the goal, all filters combined.
	Paused — the project is set aside and is no longer evaluated each night.
	Completed — the goal is reached. The badge then shows the year of completion, not a percentage.
	Abandoned — tracking was stopped; the target stays in the history.

Clicking the badge opens the **project page** in Sentinel directly. And if several projects target the same object — a second attempt the following year, for instance — the most current one is shown: in progress or paused takes precedence over completed, which takes precedence over abandoned.

Readable even without colour

Each state has its own glyph — ●, ||, ✓, ○ — on top of its hue. The badge therefore stays identifiable on a manual printed in black and white, or for an eye that is not sensitive to shades.

↪ **Link with SSI Sentinel.** These four states are those of the watch projects. See “The states of a project” in the Sentinel guide.

Exposure time: the principle

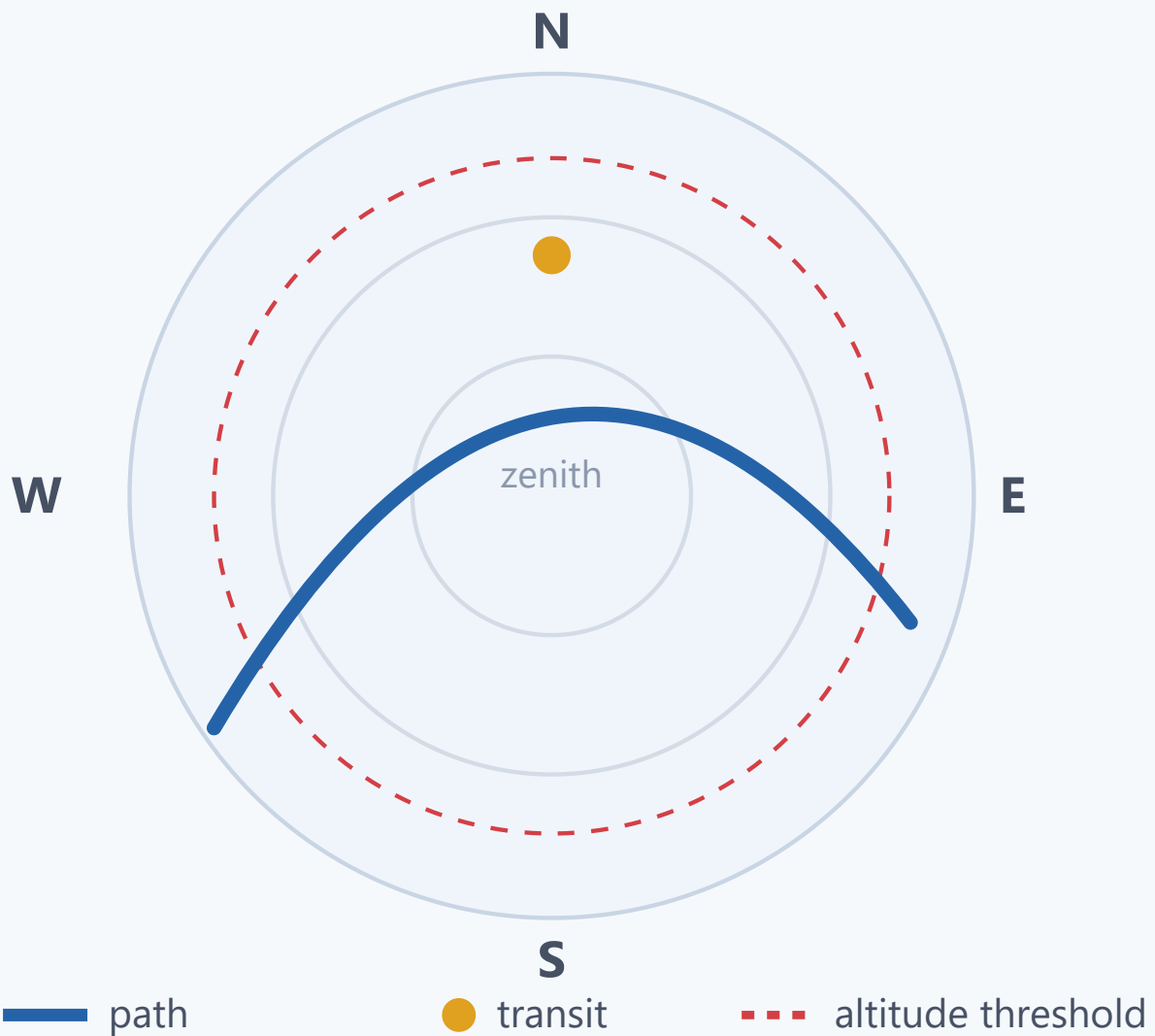
The suggestions adapt to **your configuration**. Under a polluted sky (high Bortle), the sky background saturates quickly: the tool recommends **shorter but more numerous exposures**. Under a dark sky, longer exposures are possible. Filter type and tracking mode refine the result.

What matters is total time

Short exposures in the city are not a handicap: what counts is **total integration time**. 60 exposures of 30 s = 30 exposures of 60 s in collected signal.

The polar path graph

Each target comes with a **polar graph** showing its path across the sky during the night. It reads like a view of the sky from the ground:



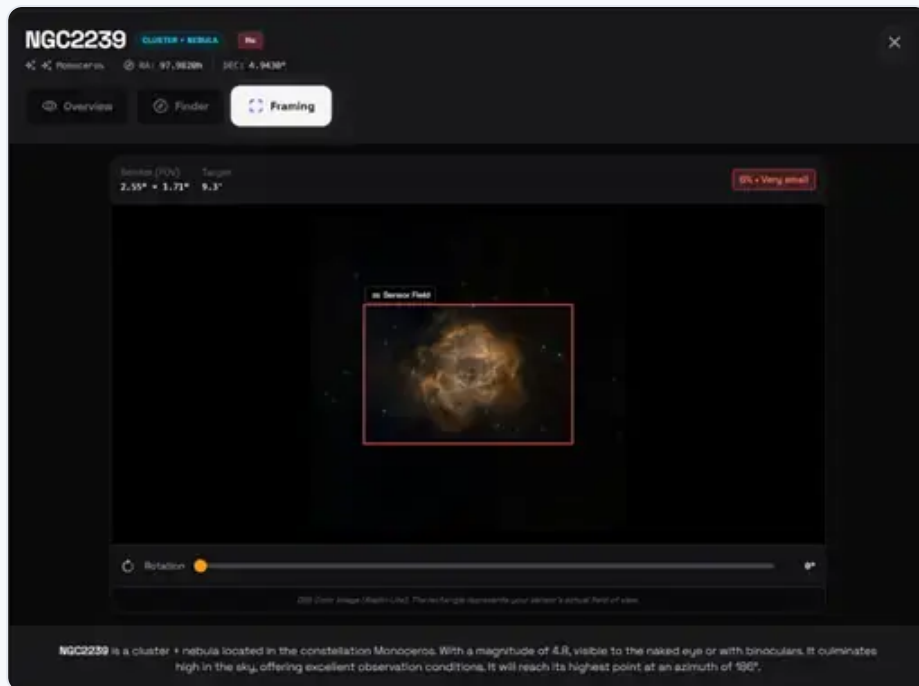
The centre = zenith (90°), the edge = horizon (0°); the circles are altitude contours every 20°. The path runs from dark (start of night) to light (end); the yellow dot is the transit (maximum altitude); the dashed red circle is your minimum altitude threshold.

The closer the path stays to the centre, the higher the target culminates. A transit near the edge indicates a target that skims the horizon.

9. Details: finder & framing

The **Info (i)** button on a card opens a details window with three tabs:

- **Overview** — the full object data sheet;
- **Finder** — an interactive sky chart to locate the target within its constellation;
- **Framing** — a field of view (FOV) simulator overlaid on the real image of the object.

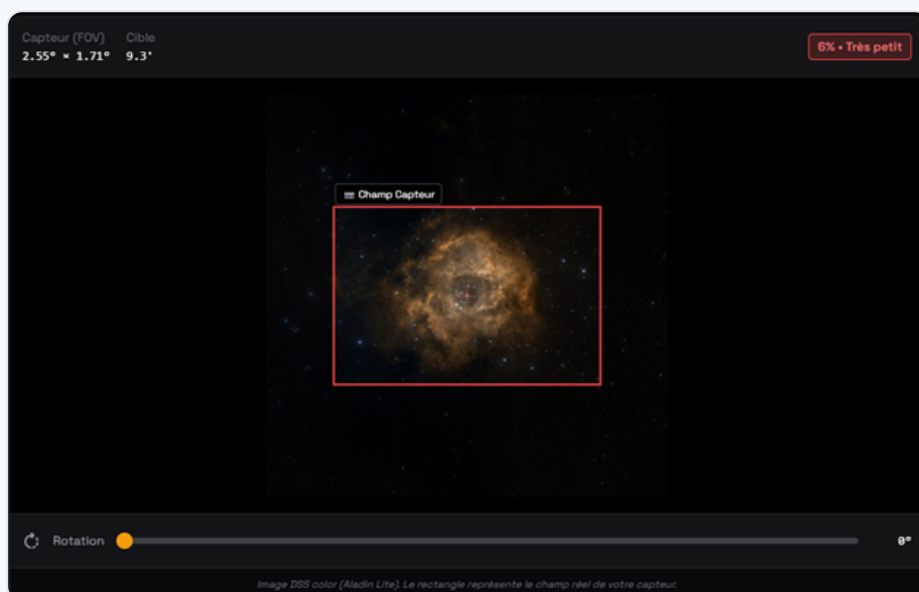


The "Framing" tab: the rectangle represents the true field of your sensor, overlaid on the image of the target. The rotation slider adjusts the position angle of the sensor.

The colour code of the frame

The field rectangle changes colour depending on how well your sensor matches the size of the object:

● **Green** · ideal ● **Yellow** · fair ● **Red** · unsuitable



The framing simulator shows the size of the sensor field (FOV) against that of the target. Here the object fills only ~6 % of the field ("Very small") — the frame is red.

You will then be able to **move and rotate** this frame in the export dialog to prepare the exact framing of the acquisition (see §12).

10. Advanced modes

Multi-filter mode

For a setup with several filters (e.g. narrowband + luminance), **multi-filter mode** exploits the position of the Moon: the Planner suggests narrowband targets **while the Moon is up**, then switches to your “dark sky” filters **once the Moon has set**.

Sequence mode

Sequence mode plans several targets one after another within the same night:

- 1 **Enable the mode** (Expert settings) before calculating.
- 2 After the calculation, **select your first target** by clicking its card.
- 3 A dialog asks you to **enter the imaging duration** (pre-filled from the Comfort mode; the maximum duration available before the end of visibility is shown).
- 4 Targets that would **no longer be observable** after your capture disappear automatically. A banner shows the estimated end time of the sequence.

Chaining tip

Start with the target whose window closes first (the one setting earliest), then chain the rest. Allow 15 to 30 min of margin between targets. Removing a target also removes the following ones (confirmation required).

Mosaic mode

Normally, an object **larger than your field of view** does not “fit” in the image: the Planner sets it aside among the targets with limitations (labelled “*Overflow (> 90% of field)*”). **Mosaic mode** changes that behaviour: it **includes these oversized objects** in the recommendations.

This is useful when you plan a **mosaic** — imaging the target as **several tiles** (panels) later stitched together to cover an object wider than your sensor (large nebulae such as the Rosette, the Veil, or Andromeda at long focal length). Enable this mode to bring those large targets into view instead of discarding them.

Dobson mode & field rotation

With an **alt-azimuth** mount (GoTo Dobson, Unistellar...), enable *Dobson / Alt-Az* tracking. The Planner then hides objects that are too faint (favouring electronically assisted astronomy) and computes **field rotation** — which varies hour by hour. The tool identifies the **best window** (slowest rotation) and colour-codes the rotation:

Calm · long exposures

Moderate

Fast · very short exposures

If you have a field rotator, tick the matching option to lift the exposure time limits.

11. Custom targets

You can add your own targets from the “**Manual entry**” section:

- **Search by name** in the **SIMBAD** database (galaxies, nebulae, clusters, stars...);
- **Manual coordinates** (RA/Dec) for any uncatalogued object.

These targets appear **at the top of the results**, with the same scoring as catalogue objects.

Recently discovered comets

Comets discovered recently (e.g. C/2025 A6) are not yet in SIMBAD: use manual entry with the coordinates for the day (TheSkyLive, Stellarium, JPL Horizons). Their position changes daily — always check the ephemeris for the day.

12. Exports & sharing

PDF sheet per target

The **PDF** button on a card generates a summary sheet: image of the object (DSS source), altitude curve for the night, recommended imaging settings and a reminder of your configuration. Ideal to print and keep at hand in the field.

Export to your sequencer

The **Export** button generates ready-to-use files for the main acquisition programs:

SOFTWARE	FORMAT
N.I.N.A.	JSON (Advanced Sequencer) or XML (Target Management).
ASIAIR	“Text Plan” mode, to copy and paste into the ZWO app.
Ekos (KStars)	<code>.esl</code> (list) or <code>.esq</code> (sequence).
APT	XML with <code>#GoTo++</code> commands for automatic centring.

You choose one of **3 exposure modes**: coordinates only, SSI recommendations, or your own exposure times. In **sequence mode**, N.I.N.A. receives a time condition per target matching the end of its planned slot.

Framing assistant

In the export dialog, the **Framing** column lets you fine-tune the field on each target: **drag the FOV frame** to reposition the centre (RA/Dec), and use the **rotation slider** for the position angle (PA) of the sensor. These settings are stored **per target** and **injected into every export** (N.I.N.A. PositionAngle, ASIAIR Rotation column, APT GoTo++ command).

Sharing your session

The **Share** button (at the top of the results) generates a **polished image** of your session — your best targets with their scores, your location, date and equipment — in a format ideal for Facebook, Discord or Instagram.

SSI Session Planner user guide — English. Screenshots and screens may change with updates. For automatic GO/NO-GO monitoring and multi-night project tracking, see the SSI Sentinel guide.