

Specification-Driven Engineering

Automated Generation of Freeform Optical Surfaces for Lighting

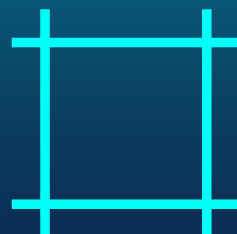
DVN Workshop Munich 5. Feb. 2026

Ingo Steiner



Define illumination goals

Define and visualize your
product requirements
Light distribution, intensity and
performance



Define mechanical constraints

Input mechanical constraints like
available space, LED placement,
surrounding geometries



Compute optical surfaces fully automatically

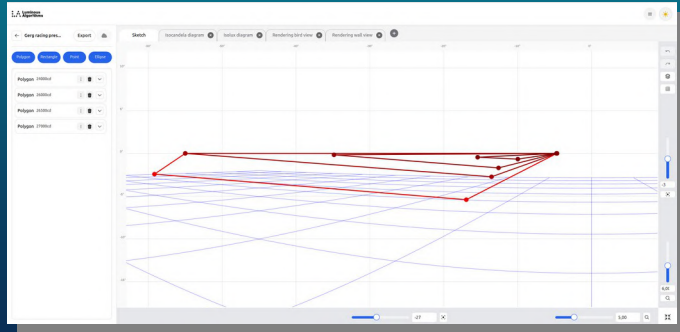
Generate optical surfaces
with a single click
No manual tweaking,
no iterative simulation loops

Pilot project: Auxiliary headlights for racing by GERG Lighthouse

Design goals

- Broad illumination
- High geometrical efficiency
- Sharp cut-off line
- Tight packaging

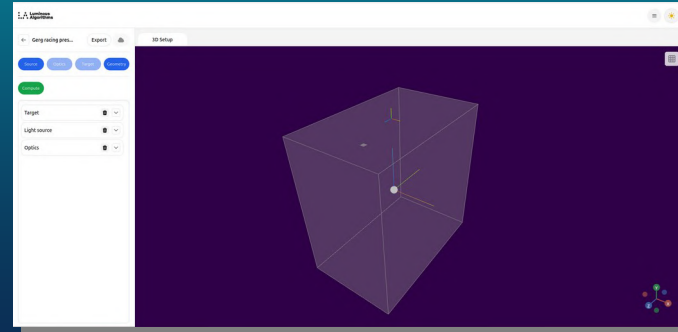




Luminous Modeler

Describe what the light should do

Test the customer experience
immediately in digital night drives

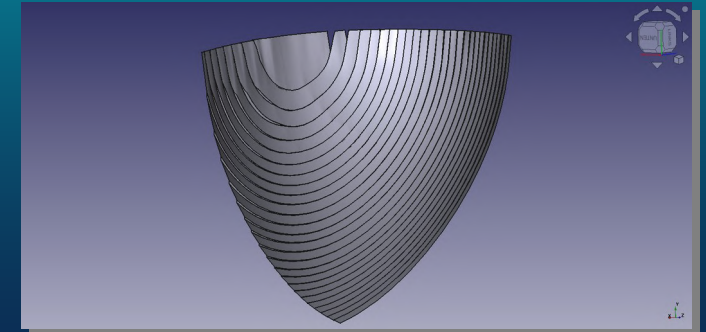


Luminous Engineer

Define LED position and
available packaging space

Evaluate feasibility in minutes

No manual trial-and-error



CAD export

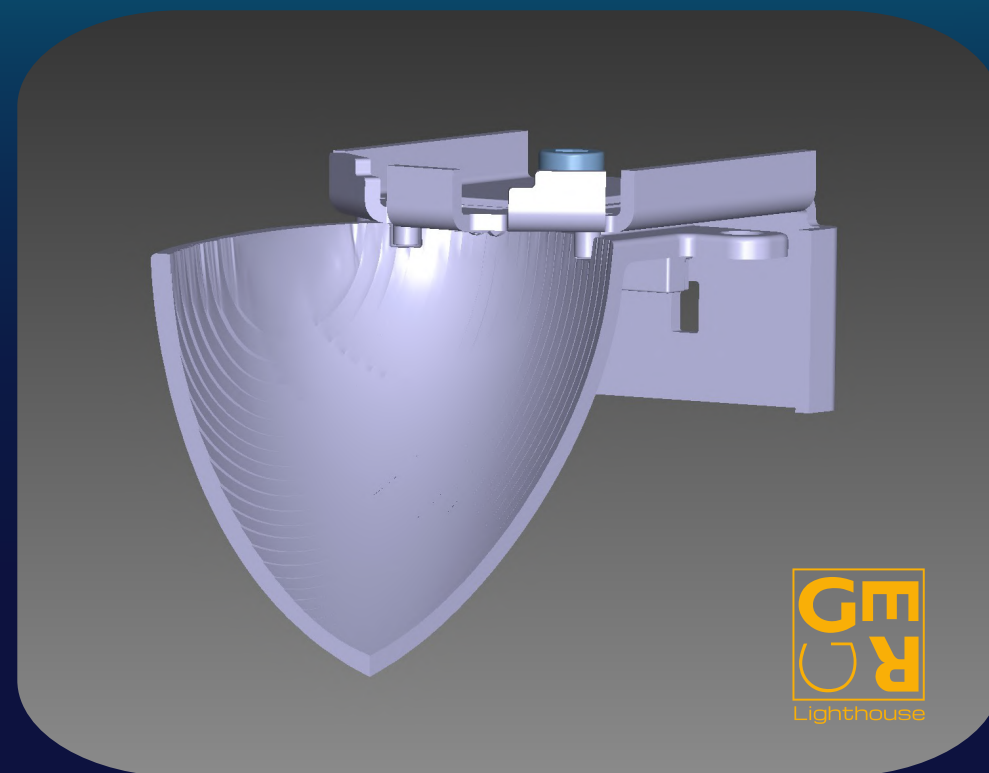
Optical surfaces exported
directly to CAD

Mechanical engineering workflows
remain unchanged

Pilot project: Auxiliary headlights for racing by GERG Lighthouse

Result

- Broad illumination: **10 to 60 deg outboard**
- High geometrical efficiency: **84%**
- Sharp cut-off line: **AK31 = 0.14**
- Light flux output: **1800lm**
- Space required: **50 x 80 x 80 mm** for reflector

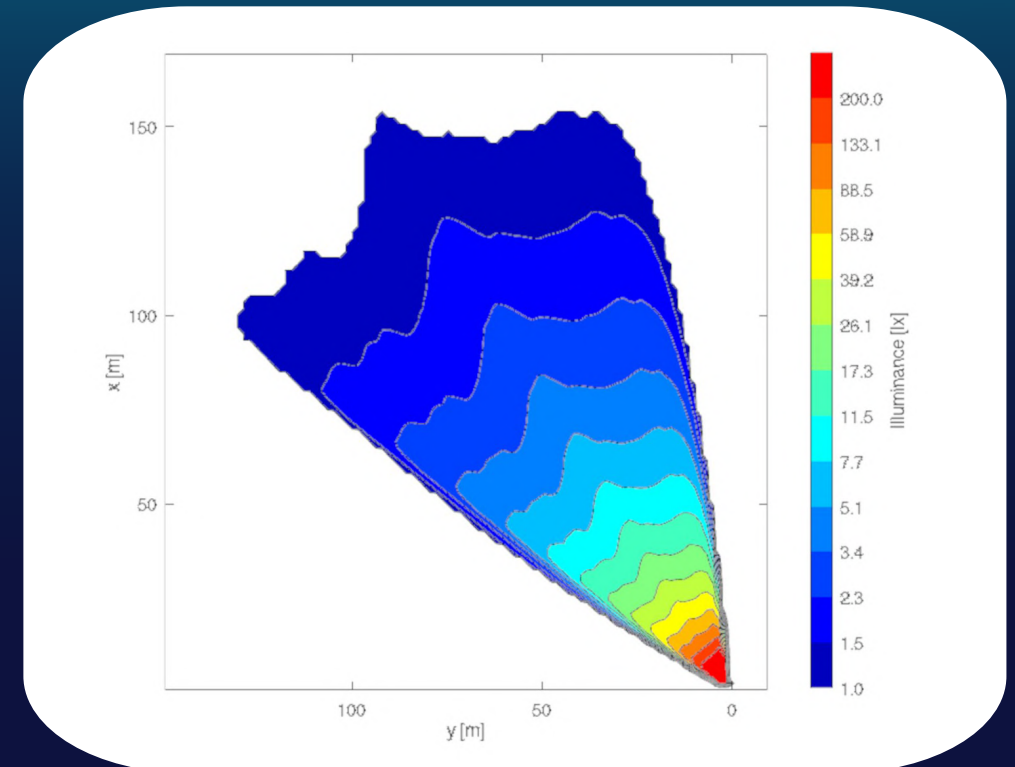


Lamp assembly

Pilot project: Auxiliary headlights for racing by GERG Lighthouse

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Illuminance on road surface

Bring your engineering up to speed

- Automatically from specifications to CAD-ready optics
- Replace iterative optical design with a linear workflow
- Faster time-to-market with predictable results

Let's meet at booth S1

luminous-algo.com



gerglighthouse.de

