Fig. S1. A logistic regression fitted to the probability of a turn larger than 45° when the stimulus was turned by 90°. There was a significant increase in the probability of a turn with increasing degree of polarization (11% polarisation: 10/15 individuals; 64% polarisation: 13/15 individuals; 100% polarisation: 15/15). We modelled this relationship as a linear increase in the log-odds of a turn with the base 10 logarithm of degree of polarization in percent (following Foster et al., 2019). The fitted model is shown as a red line with red shaded 95% confidence intervals, superimposed on the original turn angles.
Table S1. Summary of light measurements and behavioural outcome in each paradigm presented to the beetle. The table below gives a brief overview of the irradiance and wavelength measurements of each stimulus presented to the beetle, the behavioural response by the beetle in each paradigm, and the respective figure representing the result in the paper.

| Stimulus setup | Wavelength (nm) | Irradiance (photons cm\(^{-2}\) s\(^{-1}\)) |
|----------------|-----------------|------------------------------------------|
| Ersatz sun     | 520             | 1.72 x 10\(^{13}\)                       |
| Dim ersatz sun | 520             | 1.02 x 10\(^{12}\)                       |
| Overhead polarised light | 505 | 2.39 x 10\(^{14}\)                       |
| UV             | 365             | 1.04 x 10\(^{15}\)                       |
| Dim overhead polarised light | 505 | 2.39 x 10\(^{14}\)                       |
| UV             | 365             | 3.18 x 10\(^{13}\)                       |

| Response to stimulus | Condition | Response to 90° positional change of stimuli? | Figure |
|----------------------|-----------|---------------------------------------------|--------|
| Ersatz sun           | Yes       | 2A                                          |
| Overhead light 11% polarised | Yes | 2B                                          |
| Overhead light 64% polarised | Yes | 2C                                          |
| Overhead light 100% polarised | Yes | 2D                                          |
| Ersatz sun + Overhead light 11% polarised | Yes | 4A                                          |
| Ersatz sun + Overhead light 64% polarised | Cannot be determined | 4B                                          |
| Ersatz sun + Overhead light 100% polarised | No | 4C                                          |
| Ersatz sun + Dim overhead light 64% polarised | Yes | 4D                                          |
| Description                                      | Dim? | Page |
|--------------------------------------------------|------|------|
| Dim ersatz sun + Overhead light 64% polarised    | No   | 4E   |
| Dim overhead light 64% polarised                 | Yes  | 4F   |
| Dim ersatz sun (no overhead light)               | Yes  | 4G   |
| Dim ersatz sun                                   | No   | 4H   |