Supplementary Information for

Engineering multi-state transparency on demand

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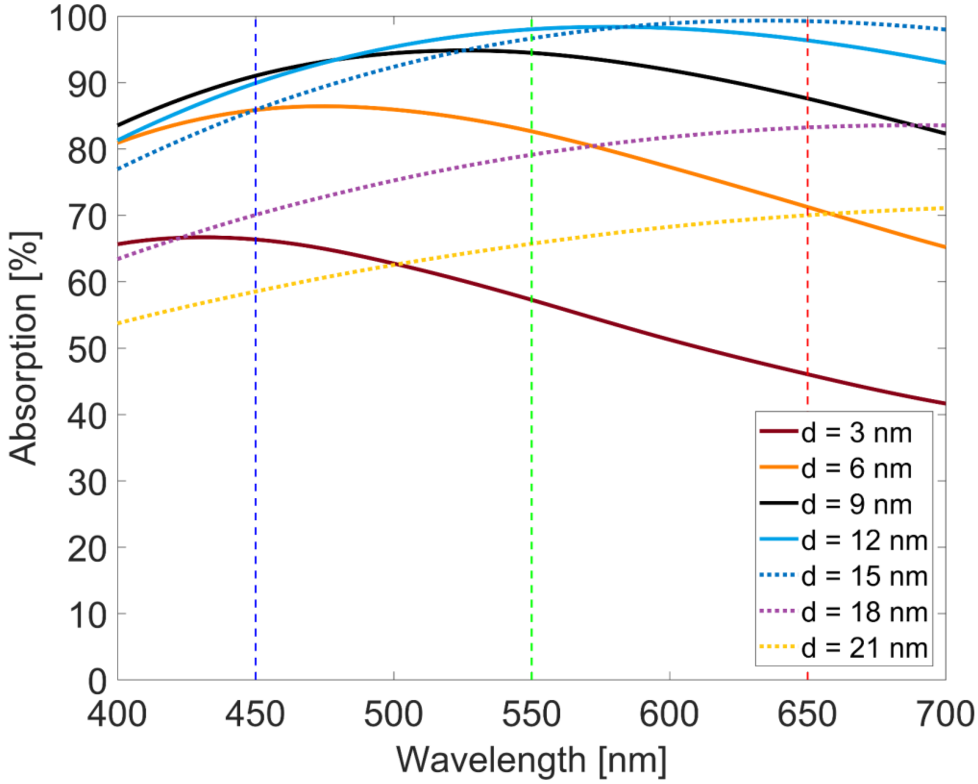


Figure S1 | Simulated absorption spectra for varying chromium thicknesses d, 60 nm MgF_2 spacer thickness and a semi-infinite aluminium mirror layer. The refractive index data for chromium are taken from the reference below (5 nm thick film) and are approximately valid for chromium thicknesses up to 12 nm (solid lines). Increasing the thickness leads to the creation of a continuous film (dotted lines), where one should use refractive index data of bulk chromium, see Supplementary Figure 2.

Lozanova, V., Lalova, A., Soserov, L. & Todorov, R. Optical and electrical properties of very thin chromium films for optoelectronic devices. *J. Phys. Conf. Ser.* **514**, 012003 (2014).

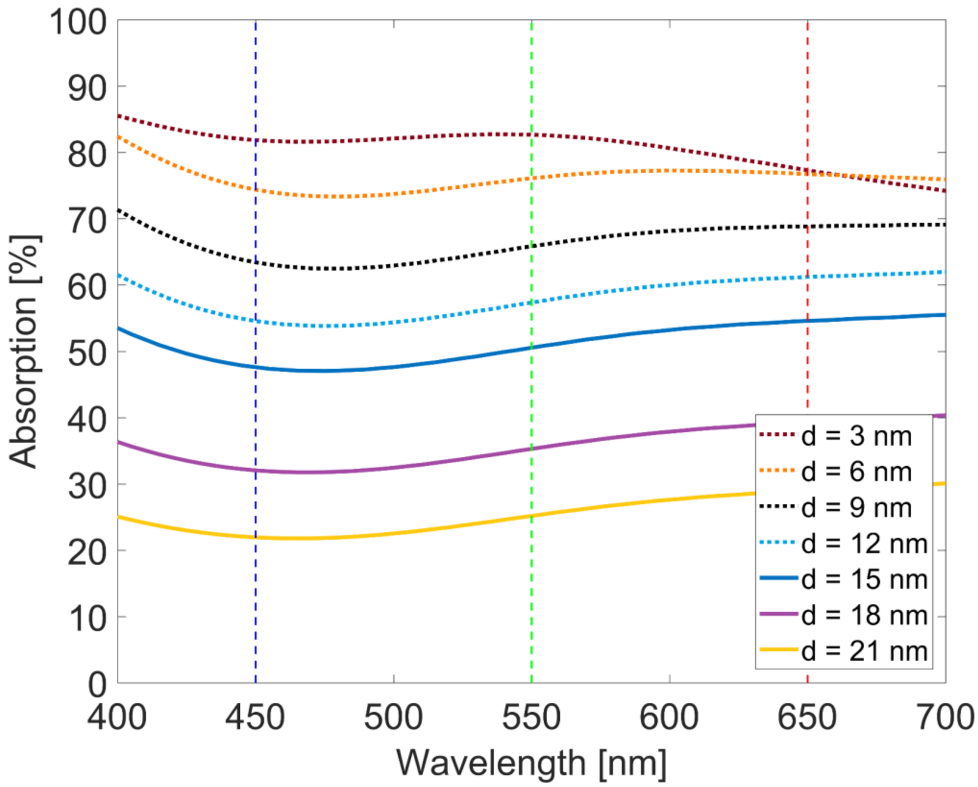
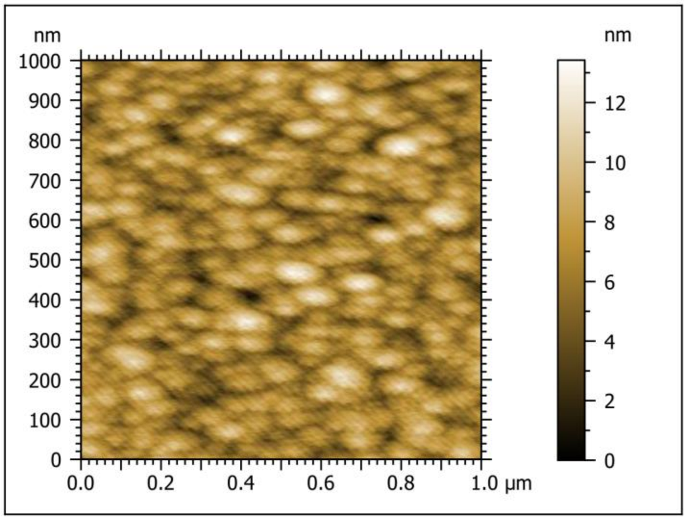


Figure S2 | Simulated absorption spectra for varying chromium thicknesses d, 60 nm MgF_2 spacer thickness and a semi-infinite aluminium mirror layer. The refractive index data of bulk chromium is taken from the reference below and are approximately valid for any chromium thicknesses greater than 12 nm (solid lines). Thinner films are discontinuous (dotted lines) and require the use of refractive index data for thin film chromium, see Supplementary Figure 1.

Palik, E. D. *Handbook of Optical Constants of Solids.* (Academic Press, 1998).



ISO 25178		
Height Parameters		
Sq	1.71	nm
Ssk	0.273	
Sku	3.20	
Sp	6.75	nm
Sv	6.67	nm
Sz	13.4	nm
Sa	1.35	nm

Figure S3 | Atomic force microscope image that reveals the smoothness of the three-layer sample in Figure 3, where consecutively a 400 nm thick aluminium layer, a 9 nm thick chromium layer and a 60 nm thick MgF_2 layer were evaporated.

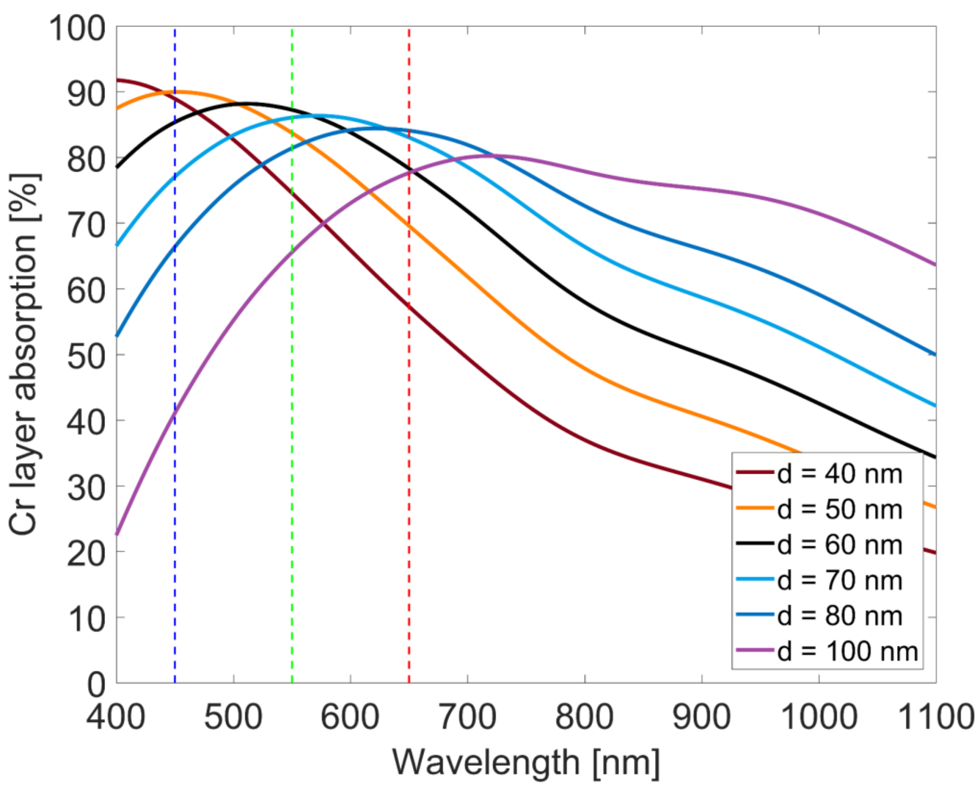


Figure S4 | Simulated absorption within the 9 nm thick chromium layer for varying MgF_2 spacer thickness *d*.

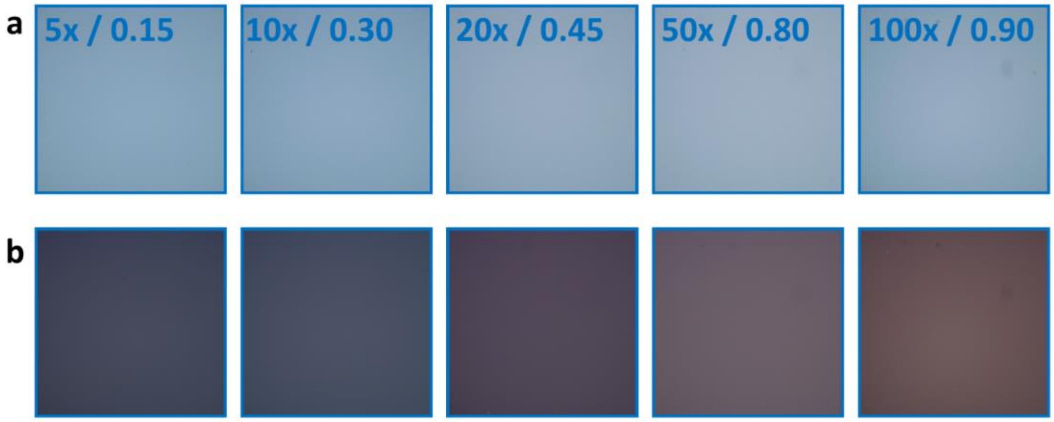


Figure S5 | Optical microscope images of two samples taken with five different magnifying objectives and numerical apertures indicated in the corresponding images. **a,** Sample with 100 nm thick MgF_2 spacer layer thickness *d* (see Fig. 1a) and **b,** sample with 80 nm thick spacer layer.

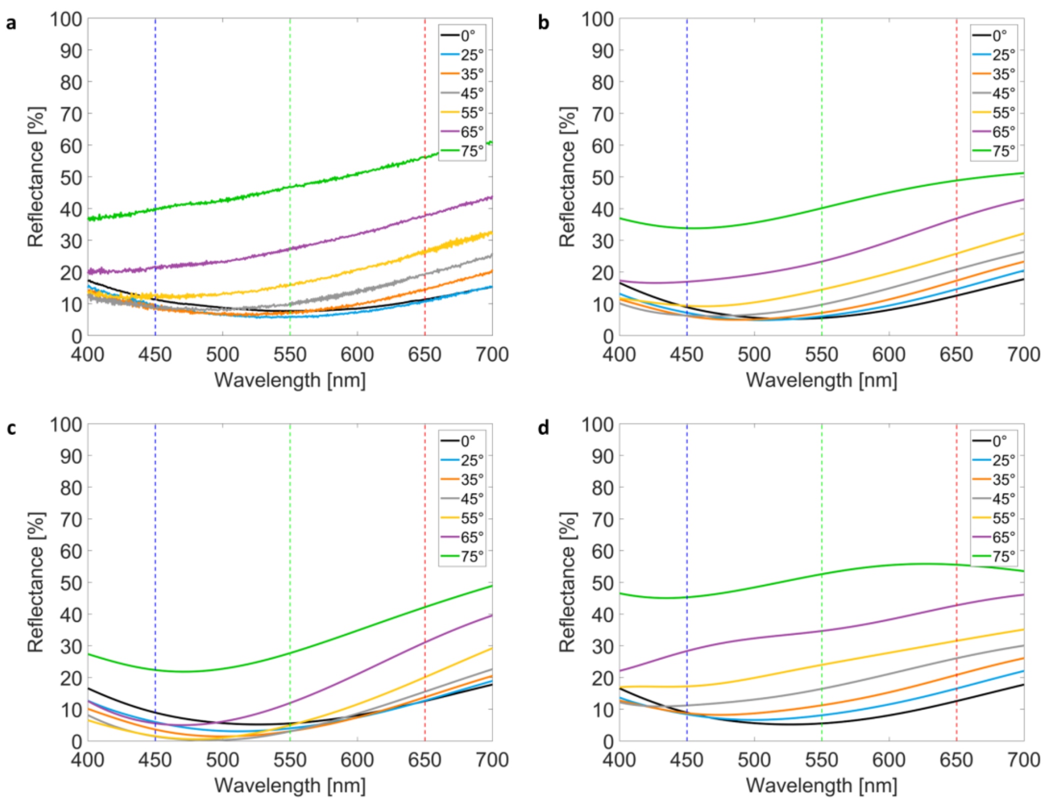


Figure S6 | Reflection spectra of the three-layer system with a 9 nm thick chromium layer and a 60 nm thick MgF_2 spacer thickness d. **a,** Measured and **b,** simulated spectra for unpolarized illumination. **c,** Simulated spectra for s- and **d,** p-polarized illumination.

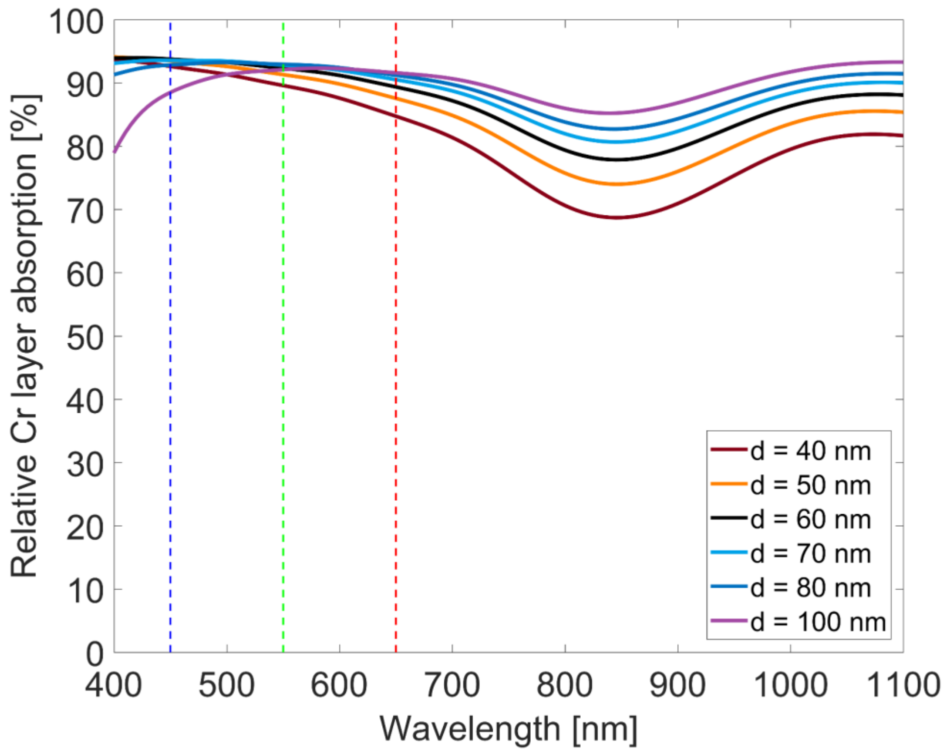


Figure S7 | Simulated relative absorption within the 9 nm thick chromium layer for varying MgF2 spacer thickness d. The relative absorption is the ratio of the chromium layer absorption, see Supplementary Figure 3, over the total absorption, see Figure 1c.

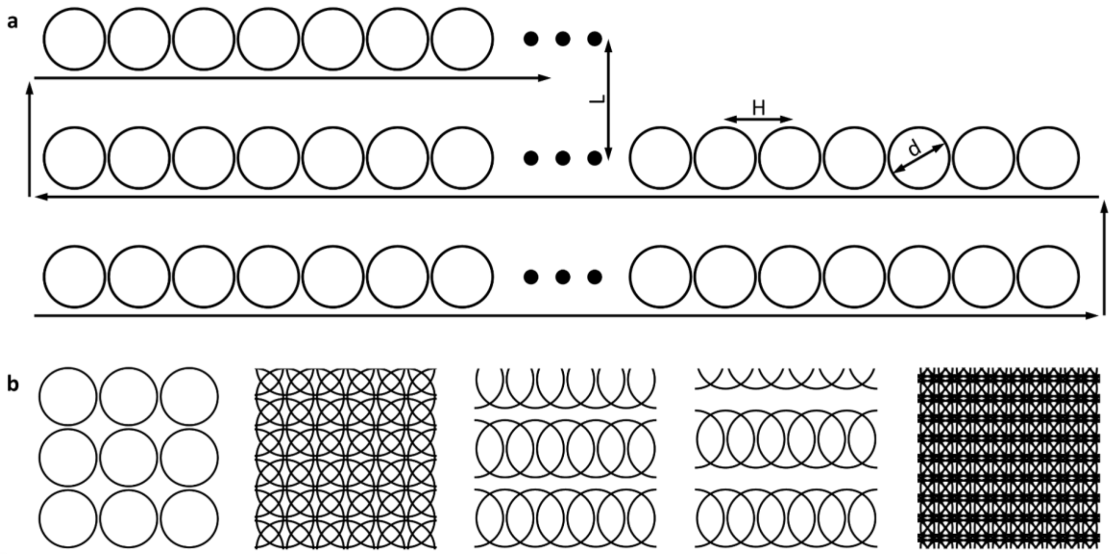


Figure S8 | Schematic visualization of the used rasterization process. **a,** The horizontal spacing *H* determines the overlap in primary scanning direction, while the line spacing *L* determines it in the secondary direction for the laser spots of diameter *d*. **b,** Resulting raster patterns for the realized states: mirror, high to low transparency, and matt from left to right.

Supplementary Table 1 | Laser and raster parameters of the five states that were used for the 3D print realization in Fig. 3 (laser pulse frequency was kept constant at 8 kHz)

State	**Laser power [%]**	**Speed [mm/s]**	**Frequency [Hz]**	**Overlap [%]**	**Raster line spacing [µm]**
Mirror	29%	400	none	none	50
High transparency	70%	200	50%	50%	25
Medium transparency	50%	200	50%	50%	60
Low transparency	50%	200	50%	50%	70
Matt	27%	100	75%	75%	15