Electronic Supplementary Material (ESI) for Nanoscale Advances.


# Electronic Supplementary Information

## Multilevel Nanoimprint Lithography with a Binary Mold for Plasmonic Colour Printing

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## Nanoimprint Lithography Results

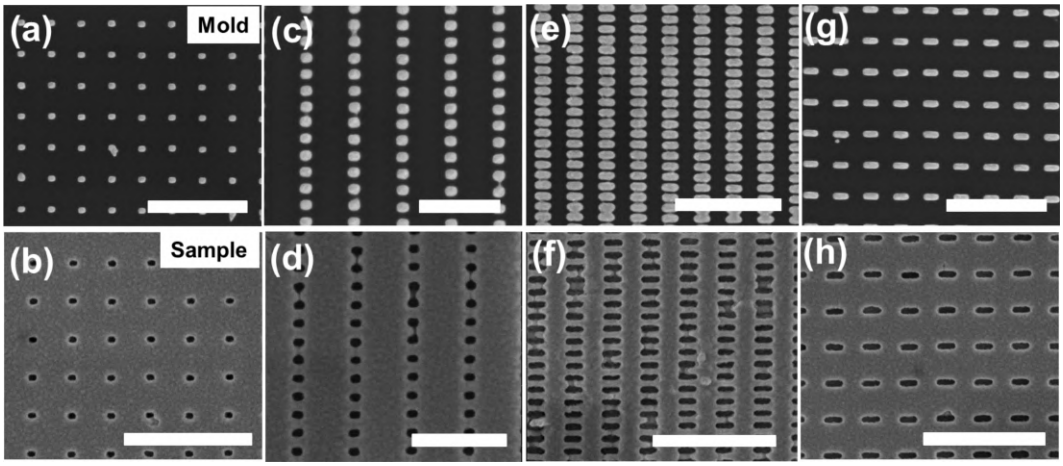


**Figure S1:** SEM images of fabricated mould with different particle geometry: (a) l=75 nm, $P_x$=100 nm, (c) l=75 nm, $P_x$=300 nm, (e) l=150 nm, $P_x$=100 nm and (d) l=150nm, $P_x$=300 nm; and SEM images of the corresponding fabricated sample with different particle geometry: (b) l=75 nm, $P_x$=100 nm, (d) l=75 nm, $P_x$=300 nm, (f) l=150 nm, $P_x$=100 nm and (h) l=150nm, $P_x$=300 nm. All scale bars refer to 500 nm

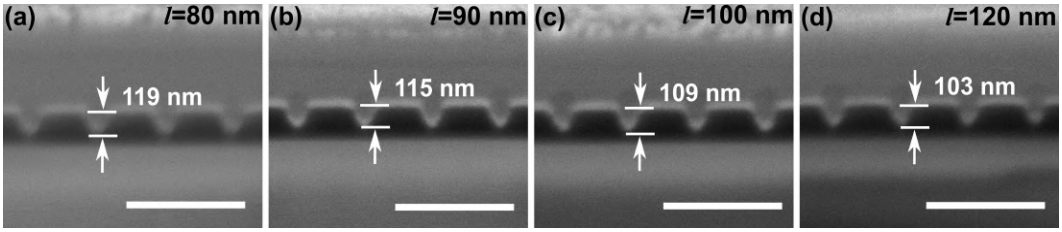


**Figure S2:** Cross-sectional images of the shows the height of the imprinted structures with fixed periodicity, $P_x$ but varying length, $l$ from 80-120 nm. All scale bars refers to 500 nm

**Table S1:** Table showing the relationship between the periodicity, $P_x$ of the imprinted structures and the resultant vertical gap size, $g$ (and the standard deviation) measured from the SEM images. The equation of line of best fit and the r-square value were obtained from the line plot showed in Figure 3.

| Periodicity, $P_x$ (nm) | 100 | 140 | 180 | 220 | 260 | 300 |
|---|---|---|---|---|---|---|
| Vertical gap size, $g$ (nm) | 15.3 | 27.2 | 39.3 | 53.6 | 65.5 | 84.6 |
| $g$ (standard deviation, nm) | 2.862 | 4.093 | 4.467 | 3.872 | 3.086 | 4.658 |
| Equation of line of best fit | y=0.339x-20.371 | | | | | |
| R-square value | 0.99365 | | | | | |

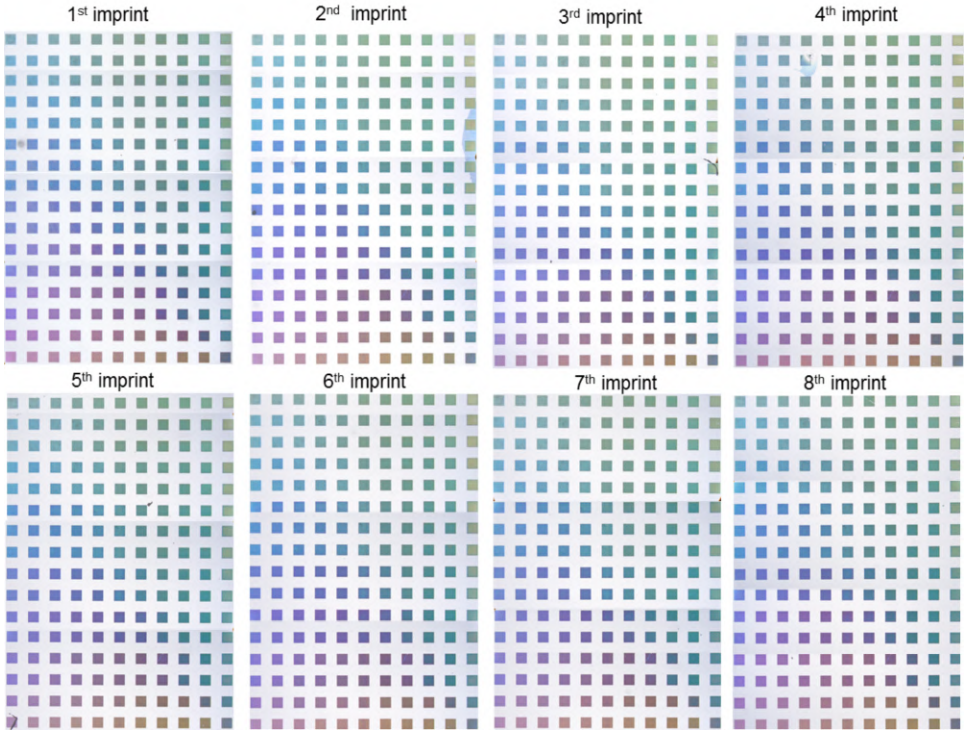


**Figure S3:** Bright field image of color palettes of reproduced nanoimprinted samples from first to eighth imprints under linearly polarized light with direction parallel to the long-axis of the nanorods

# Finite Element Method (FEM) Simulations Results

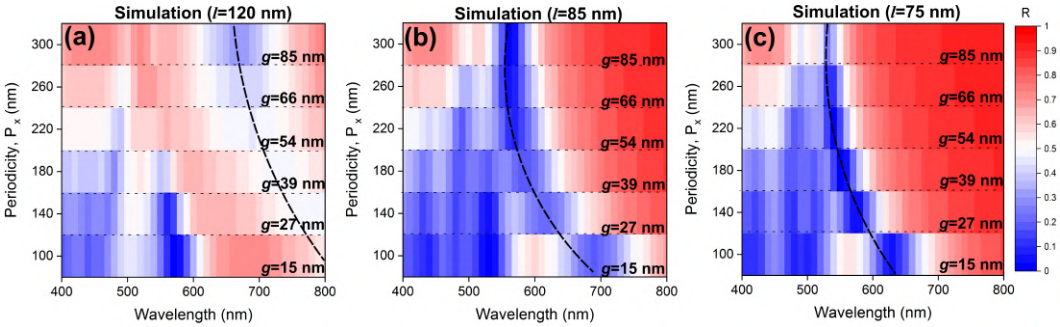


**Figure S4:** Simulated 2D reflectance map showing the effect of lattice period, $P_x$ and film/nanorod gap, $g$ for nanorod of length (a)$l$ =120 nm, (b)$l$ =85 nm and (c)$l$ =75 nm. The dashed line indicate the shift of the resonance wavelength (dipole mode) as the gap increases.

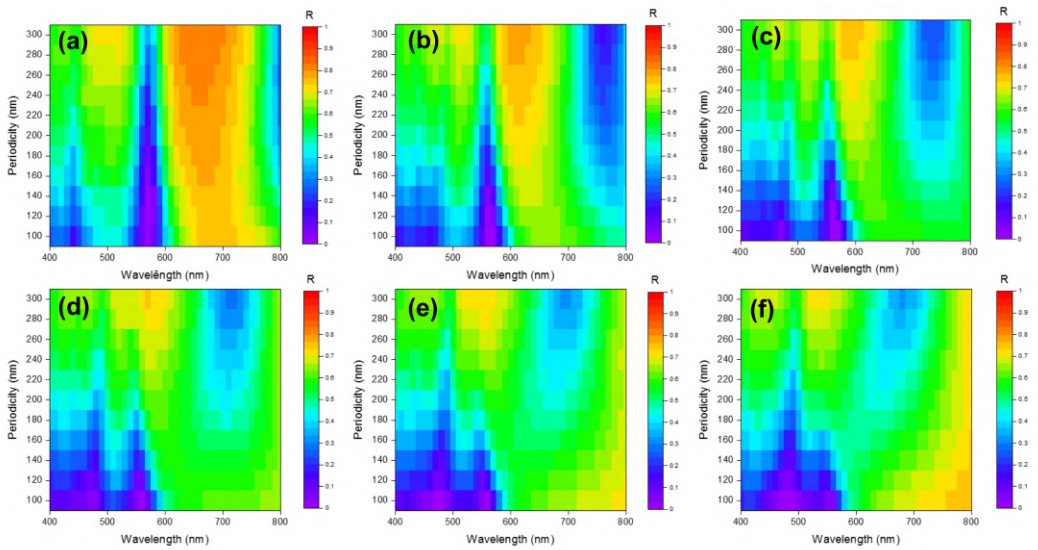


**Figure S5:** Simulated 2D reflectance map showing the effect of lattice period, $P_x$ for different film/nanorod gap size, g i.e (a) g=10 nm, (b) g=20 nm, (c) g=30 nm, (d) g=40 nm, (e) g=50 nm and (f) g=60 nm