**Thermally controlled metasurfaces for sensing applications and image generation**

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Recent advancements in nanofabrications, characterisations and computer modellings allow the generating of novel metasurfaces that control the light characteristics in extraordinary ways. Such advances have led to revolutionary applications in several fields, including but not limited to metalenses, polarisation converters, nano-sensors, and holograms. Meanwhile, the active and reversible tunning of metasurfaces has attracted significant attention due to the larger degree of freedom that tunable metasurfaces can offer. Tunning metasurfaces can be obtained by various external stimuli, such as mechanical, electrical, optical, etc. This talk reviews our recent achievements in employing temperature for controlling the light-matter interactions in dielectric metasurfaces. I demonstrate how the encoded transmission pattern can be tuned by controlling a dielectric metasurface's temperature. Through the exploitation of the thermo-optical properties of silicon, we have achieved complete control of the images' contrast by altering the metasurface temperature.

**Short Bio:**

Mohsen Rahmani is a professor of optics and photonics and the leader of the advanced optics and optics laboratory at Nottingham Trent University (NTU), in the UK. He obtained his PhD from the National University of Singapore in 2013, followed by a postdoc fellowship at Imperial College London and the Australian Research Council Early Career Fellowship at the Australian National University. In 2020, he joined NTU via the prestigious Royal Society Wolfson Fellowship. Shortly after moving to the UK, he was also awarded the UK Research and Innovation Future Leaders Fellowship. His research activities span over light-matter interactions with nanometre-scale particles for applications in flat optics, near-infrared imaging, bio-sensing, and reconfigurable optics. He is the recipient of several prestigious awards and prizes, including the Australian [Eureka Prize](https://www.youtube.com/watch?v=ZNiBQAmfowE&ab_channel=AustralianMuseum) (Australian Oscar of Science), the Early Career Medal from the International Union of Pure and Applied Physics, and the Australian Optical Society Geoff Opat Award. Professor Rahmani has delivered 40+ invited talks, seminars and keynotes at international conferences and has published more than 80 peer-reviewed journal papers ([H-index=43](https://scholar.google.com.sg/citations?user=MDIjHvIAAAAJ&hl=en&oi=ao)). He is the past chair of the IEEE Nanotechnology Chapter across the UK and Ireland section and a distinguished lecturer for IEEE Nanotechnology Council 2024.