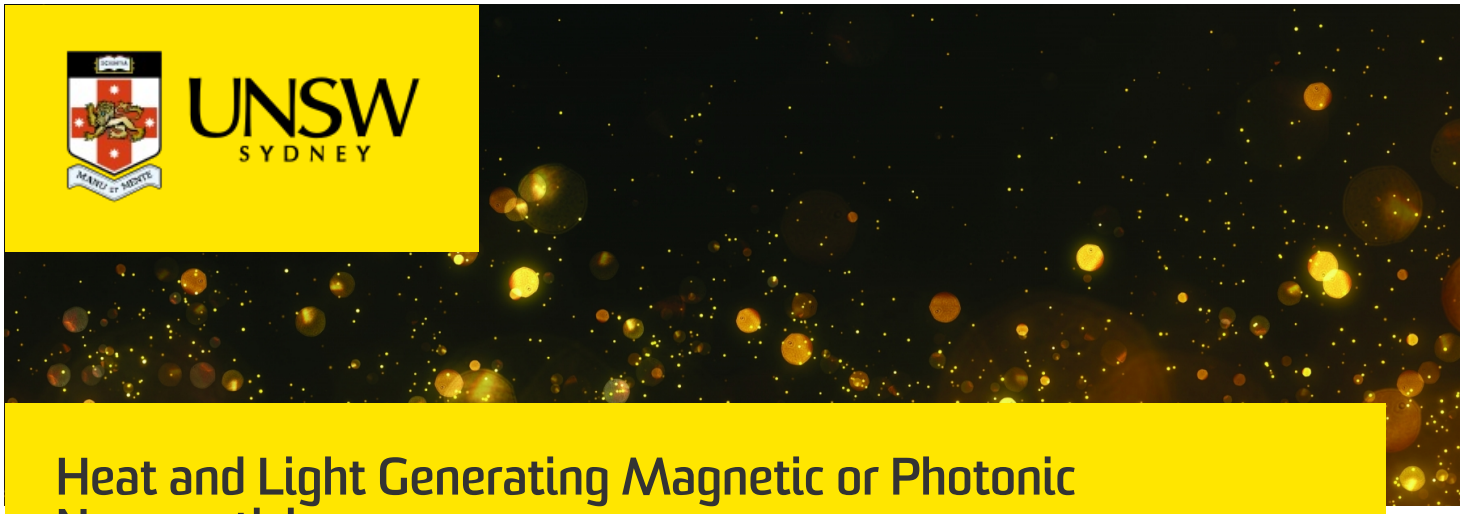

# Heat and Light Generating Magnetic or Photonic Nanoparticles

**Custom designed magnetic or photonic nanoparticles can generate heat or light in a highly controllable, precise and efficient manner, across a wide range of length scales. When these nanoparticles are combined with drug carrying macromolecules or catalytic materials, heat or light triggered drug release can be achieved. The nanoparticles can also be used as a contrast agent or tracer for imaging (MRI, MPI) and sensing of biological systems. This technology is used in situations where spatial, temporal and dosage control is required in drug delivery, or where simultaneous drug delivery and medical imaging or sensing is required for effective treatment of disease or injuries.**


## More Information

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## Competitive advantage

- Precise control of heating rate and footprint in the nano or micro-length scale
- Spatial, temporal, and dose control of drug delivery
- Simultaneous high-resolution, high-sensitivity and real-time imaging
- Multiplex, high-sensitivity and real-time sensing
- Radiation-free and highly sensitive imaging modality
- Magnetic capture for sensing

## Impact

- More effective detection, diagnosis and treatment of disease, leading to improved prognosis for patients.

## Successful outcomes

- Gold coated magnetite nanoparticles for metal ion detection
- Needle shaped magnetite for spatial and temporal control of drug release
- Magnetite stabilised liposome for drug delivery

## Capabilities and facilities

- The laboratory houses the Nanotheric magneTherm, and Ambrell EASYHEAT magnetic induction heating system
- Nanotheric magneTherm enables magnetic fluid and nanoparticle to be tested in field strengths up to 20 kA/m (25 mT) and over a wide range of user-configurable frequencies

- The laboratory also houses a Horiba Fluoromax-3 Spectrofluorometer equipped with a class 3B NIR laser for the characterisation of photonic upconversion of nanoparticles

## Our partners

- Lipotek