



## THERMAL LASER WITH DYNAMIC BEAM STEERING

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Inventors: Victor Brar, Joel Siegel

### The Invention

UW-Madison researchers have developed a compact thermal laser on a chip capable of steering emitted thermal radiation at a continuous range of angles through the application of a voltage. The device is a metamaterial that emits light at only designated frequencies and incorporates an active material (graphene) to change the angle at which the light is emitted. They have demonstrated active control of angular thermal emission in the mid-infrared regime (MIR) from  $\pm 16$  degrees. The device is modulated via electronic control of the carrier density of graphene that is incorporated into the metastructure. The metasurface emits the thermal radiation into angular lobes, with the electrostatically tuned graphene beneath the grating changing the interference condition of the emitted light, thereby actively tuning the angle of emission.

### Additional Information

#### For More Information About the Inventors

- [Victor Brar](#)

#### Tech Fields

- [Semiconductors & Integrated Circuits : Design & fabrication](#)

For current licensing status, please contact Michael Carey at [mcarey@warf.org](mailto:mcarey@warf.org) or 608-960-9867