Clock ticking away for ‘cloak of invisibility’

U.S. university team creates design to make things invisible

Anand Parthasarathy

BANGALORE: ‘Mai hoon Mister India!’ Remember Shekhar Kapur’s hugely popular 1987 film, where Anil Kapoor can appear and disappear at will — thanks to a secret formula? If that is too long ago for you, may be you are a fan of the Harry Potter books where the young hero puts on his ‘cloak of invisibility’ every now and then?

Optical cloak

Fiction like this might soon be mirrored by fact: A research team at the Nanotechnology centre of Purdue University, West Lafayette, Indiana, U.S., has created a design that could render people or objects invisible by placing an optical ‘cloak’ around them.

The tool looks like a spiky, round, hairbrush, and consists of an array of ‘nano’ (or extremely tiny) needles. It bends light rays, deflecting them away from the cloaked object, so that it is not illuminated — and hence is invisible to the human eye.

The results of the research have been published in the scientific magazine, Nature Photonics and forms the cover story of the April 2007 issue. (“Optical cloaking with meta materials” pp 224-227).

The work was carried out by teachers and students of the University’s Nano Photonics research group.

Professor Vladimir Shalaev, an internationally renowned authority in the field, led the group. One of the five co-authors is Uday K. Chettiar, an IIT Bombay alumnus, currently working for a doctorate in Electrical Engineering at Purdue.

The mathematical basis for ‘bending’ light rays so that they leave objects in ‘darkness’ has been suggested last year by separate research work carried out at Imperial College, London, St. Andrews University, Scotland and Duke University, U.S. — but they seemed to suggest that realisation was at least five years away. The Purdue work while still a simulation, holds out the hope that an invisibility device can be fabricated — soon. Prof. Shalaev points out that their work was restricted to a single wavelength — while the spectrum of visible colours covers many wavelengths. But even with this limitation, he sees immediate applications: Soldiers in the battlefield can remain invisible to night vision devices which typically work on a single frequency.

But one result will be of special interest: A wavelength of 632.8 nanometers will make an object invisible, say the Purdue researchers. That corresponds to the colour red. Maybe, one day, you can put on that red cloak — and vanish.

(Details of the research as well as videos showing how the invisible cloaking works can be found at this web page: http://news.uns.purdue.edu/x/2007a/070402ShalaevCloaking.html)