SA scientists develop world's first digital laser

Researchers at South Africa's Council for Scientific and Industrial Research (CSIR) have developed the world's first digital laser.

(Image: GCIS)

The innovation, according to CSIR researchers, is regarded as a milestone in laser technology and could spur future laser-related innovations. Researchers say the development of the digital laser could have possible applications predominantly in the health, manufacturing and communications sectors, and other industries.

The team of researchers behind the innovation describe the development of the digital laser as a "disruptive technology", which will help to create a new market and value network, and eventually disrupt the existing market and value network over time.

Addressing the media on the new innovation, Science and Technology Minister Derek Hanekom said the development of the digital laser opened up a whole new world of opportunities.

"For us, it is important that technological advancements have to improve the lives of our people and help us address some of the many challenges we face as a country. This could be through skills development and ultimately job creation," said Hanekom.

What makes the digital laser special

Laser devices normally consist of mirrors, energy and a casing containing a medium, for example crystal or glass. The medium changes the frequency of the light to create a laser beam with the perfect characteristics for these different applications.

In conventional lasers, the shape of the light that comes out is either not controlled at all, or a single shape is selected by

expensive optics. For example, when a medical doctor undertakes surgery, the beam must be appropriate for precision cutting.

The digital laser uses a spatial light modulator. It has a liquid crystal display (LCD) that can be digitally addressed with greyscale images that alter the beam.

"This ground-breaking development is further evidence of the great potential we have in scientific innovation. That the world's first digital laser should come from our country is testimony to the calibre of scientists that South Africa has," Hanekom said.

CSIR researcher Professor Sandile Ngcobo, who conducted the groundbreaking experimental work as part of his PhD studies, believes the significance of the research demonstrates the ability within the CSIR to lead innovation in this field.

"I believe the digital laser [is] a disruptive technology. This is technology which may change the status quo and which could create new markets and value networks within the next few years or decade," he said.