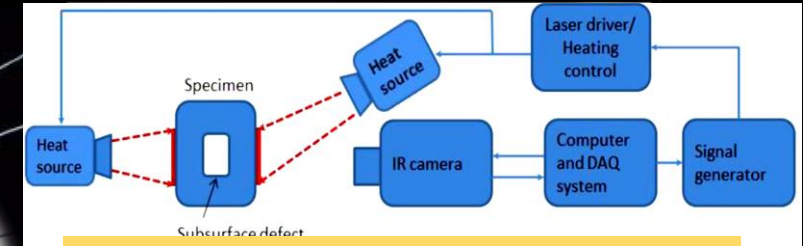
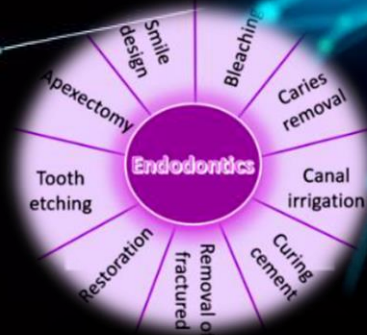


# EXPLORING BIOPHOTONICS IN DENTISTRY



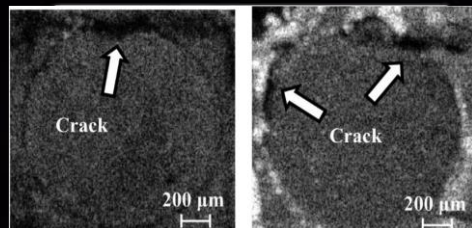
Photonics applications remain advantageous compared to conventional techniques in that they are non-contact and nondestructive and allow for multiple nanometre-scale measurements of over large areas.



## Photoelasticity

To determine the biomechanics and stress distributions of various implant designs

**Moiré interferometry** studies deformation of materials.



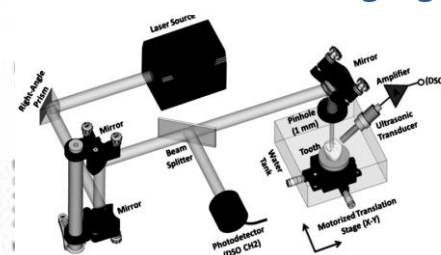
**Optical coherence tomography**  
Detection of microleakage of restorations



## Quantum dots

semiconductor nanocrystals with unique optoelectronic properties; when stimulated and excited, they release energy via single photons.

## Photoacoustic Imaging



Detect carious lesions in the early stages

## LASERS

- $\text{CO}_2$  (10.6  $\mu$ m) Soft tissue ablation
- Nd:YAG (1.064  $\mu$ m) Root canal therapy, caries removal
- Er,Cr:YSGG (2.78  $\mu$ m) Bone ablation, caries removal
- Argon (572 nm) Polymerization of restorative resin materials
- Diode (810–980 nm) Promotion of healing of lesions or