Direct growth of InAs/GaSb type II superlattice photodetector on silicon substrates

Claudia González Burguete
Claudia.Burguete.16@ucl. c.uk

Department: **Electronic and Electrical Engineering**
Supervisor: **Dr Jiang Wu (*Jiang.Wu@ucl.ac.uk*)**

Objectives

- To develop a mid-wave infrared photodetector using type 2 superlattice structure with silicon substrate.
- To develop a tailor-made type 2 superlattice structure.
- To optimise fabrication methods.
- To develop a large focal plan array sensor.
- To develop a prototype.

Methodology

- The first step is building a semiconductor, which is built layer by layer (superlattice), like a cake, in order to be tailored to capture a specific range of infrared light.
- The next step is fabricating a photodetector structure within the semiconductor, in order to test the efficiency of the semiconductor.
- The next step is building a bigger structure (termed as Focal Plane Array). This is the photodetector which is the main component of the sensor system.
- The last step is developing a prototype camera with the tailor-made photodetector.
- The ***infrared photographs*** are able to depict more details than a normal photograph, which only captures the visible light. The infrared photographs depict in white every branch of the tree and ignores the lights (inside and outside the building).

Project

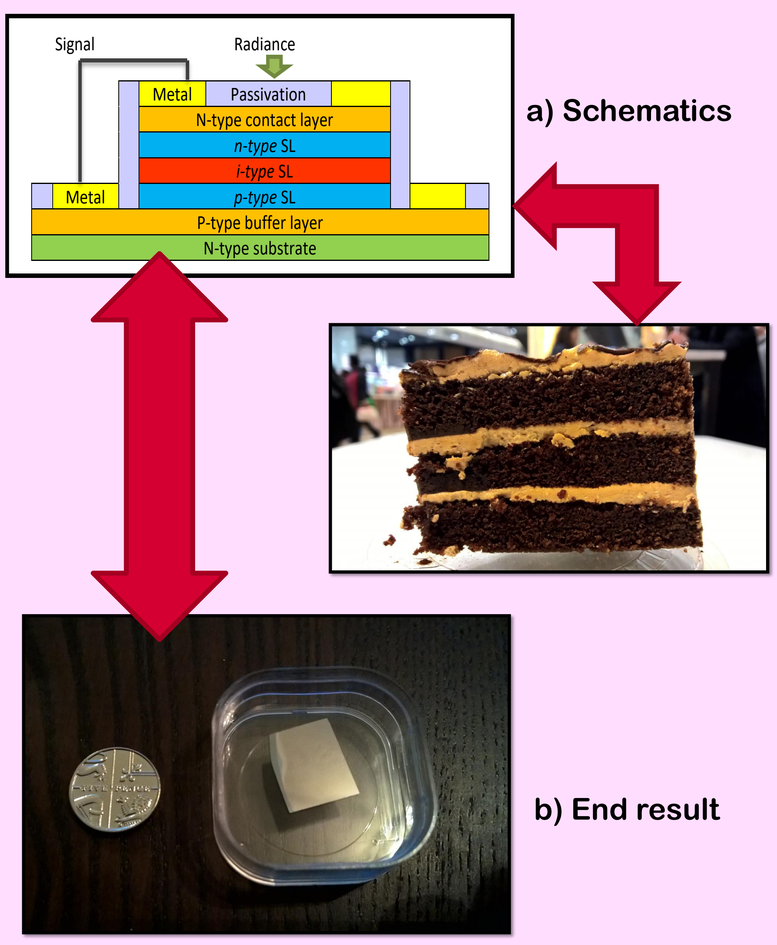


Figure 1: The Semiconductor

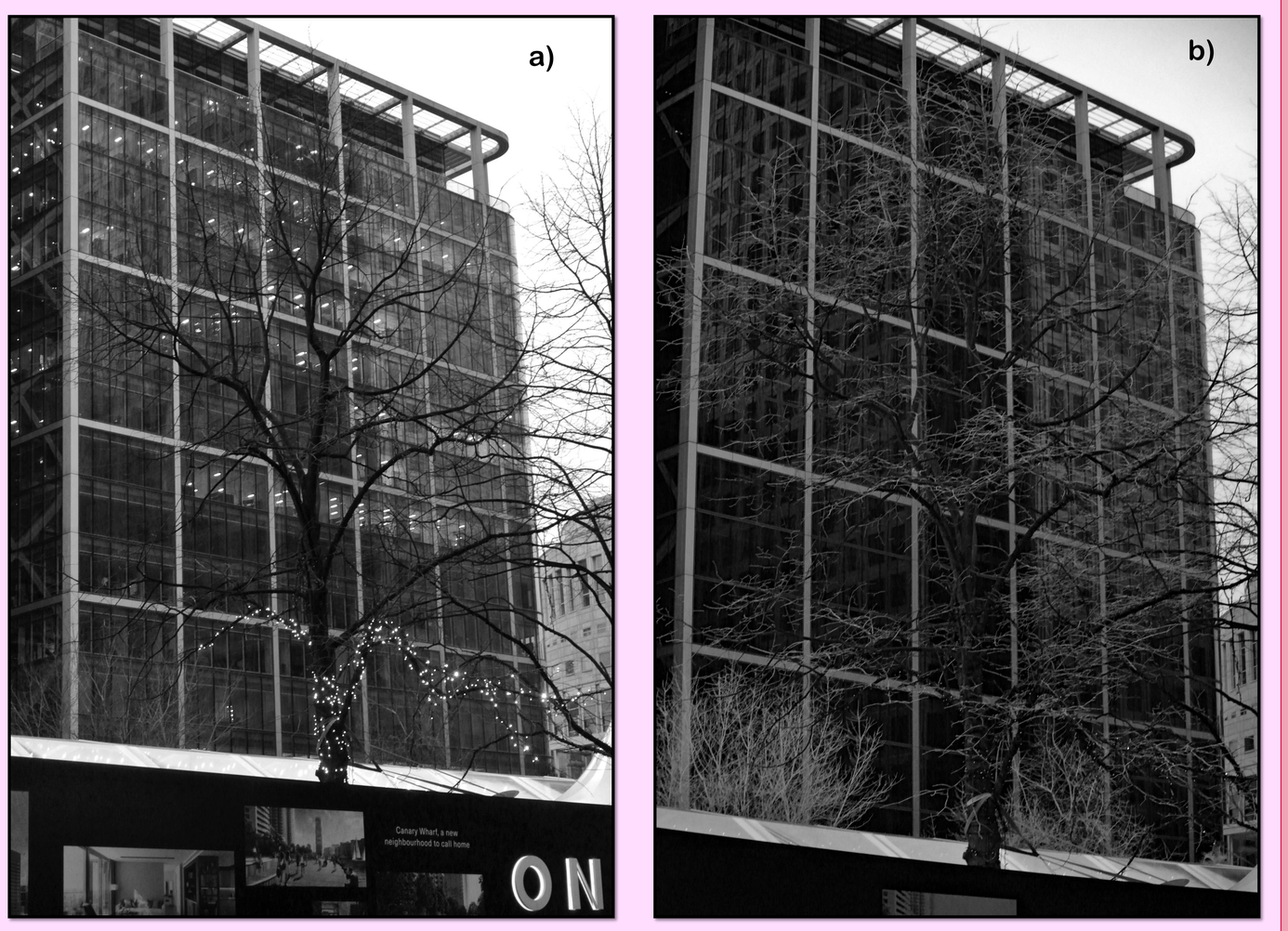
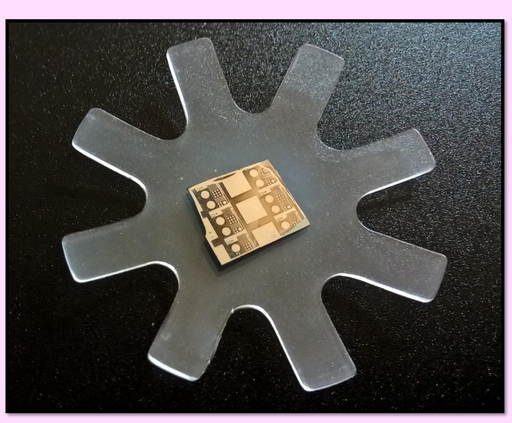
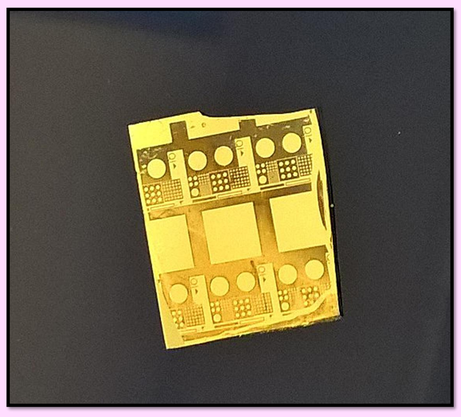


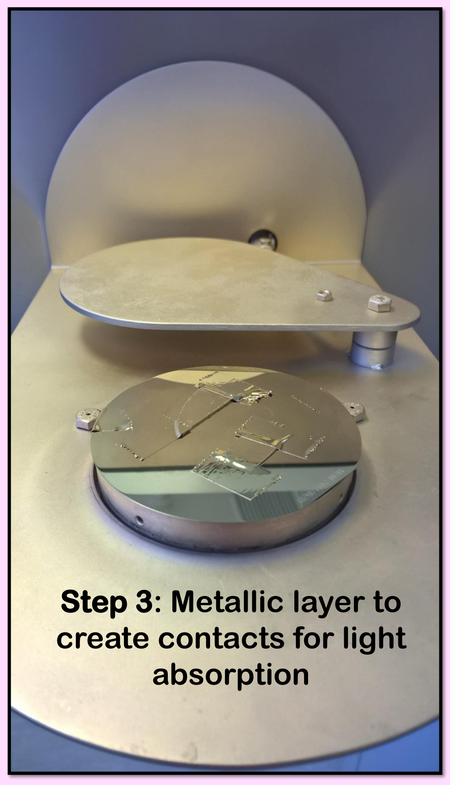
Figure 4: Photographs from two Nikon J1 cameras; a) Visible light and b) Infrared



Step 1: Defined photodetectors structures using lithography



Step 2: Protective layer to prevent energy leakage



Step 3: Metallic layer to create contacts for light absorption

Figure 2: Fabrication Step by Step

Figure 3: The sensor System of Camera

Business Card

Please get in touch for more information

Communications Manager UCL Communications and Marketing
Tel: 020 3108 3854 Ext: 53854

Collaborators logos