

Duality

Titanium, sterling silver.

Pin 7.5cm x 1cm

Cuff links 1.5cm diameter

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Duality: Particle tie pin and wave cufflinks Image © Green Vale Gallery

Inspiration:

Professor Serge Haroche

Serge Haroche, French physicist and joint Nobel prizewinner (2012) has inspired an artistic interpretation of his research - a jewellery suite that has light as a point of focus, with its dual wave-particle personality.

Materials:

A piece of titanium (donated) was selected as the material of choice due to its inherent properties of tension: once formed it remains resistant to change and hence makes a useful spring mechanism. The surface of titanium may be oxidised, and hence coloured, by the introduction of electricity or heat. Sterling silver findings and rivets were used to construct the cufflinks as titanium cannot be soldered.

Method:

The titanium was milled to an appropriate thickness, and hand-sawn into relevant shapes. For the tie pin, one half was corrugated to form a clasping mechanism. The titanium on the cufflinks was riveted with sterling silver. Prior to assembly, the titanium was prepared for oxidisation (colouring) by removing surface imperfections and old oxidisation. This included filing, smoothing with emery paper, cutting with an abrasive compound and polishing. Coloration was achieved by anodising. A source of variable DC power was constructed using multiple 9 volt batteries; the piece acted as the anode and a paintbrush (with metal ferrule) the cathode. Different voltages were used to produce different thickness of oxide layers, different frequencies of optimally-reflected light waves, and hence coloured surfaces.

Results:

Duality: Two electrically-painted items relying on the wave nature of light for their colours - a particle tie pin (with wave clasp) and wave cufflinks (in the shape of a particle).

The box is made from salvaged Australian native timbers - a Silver Ash lid (*Flindersia bourjotiana*) and Red Cedar (*Toona ciliata*) body. Made for Labpunk and the AIP Congress 2014 by Gary Field.