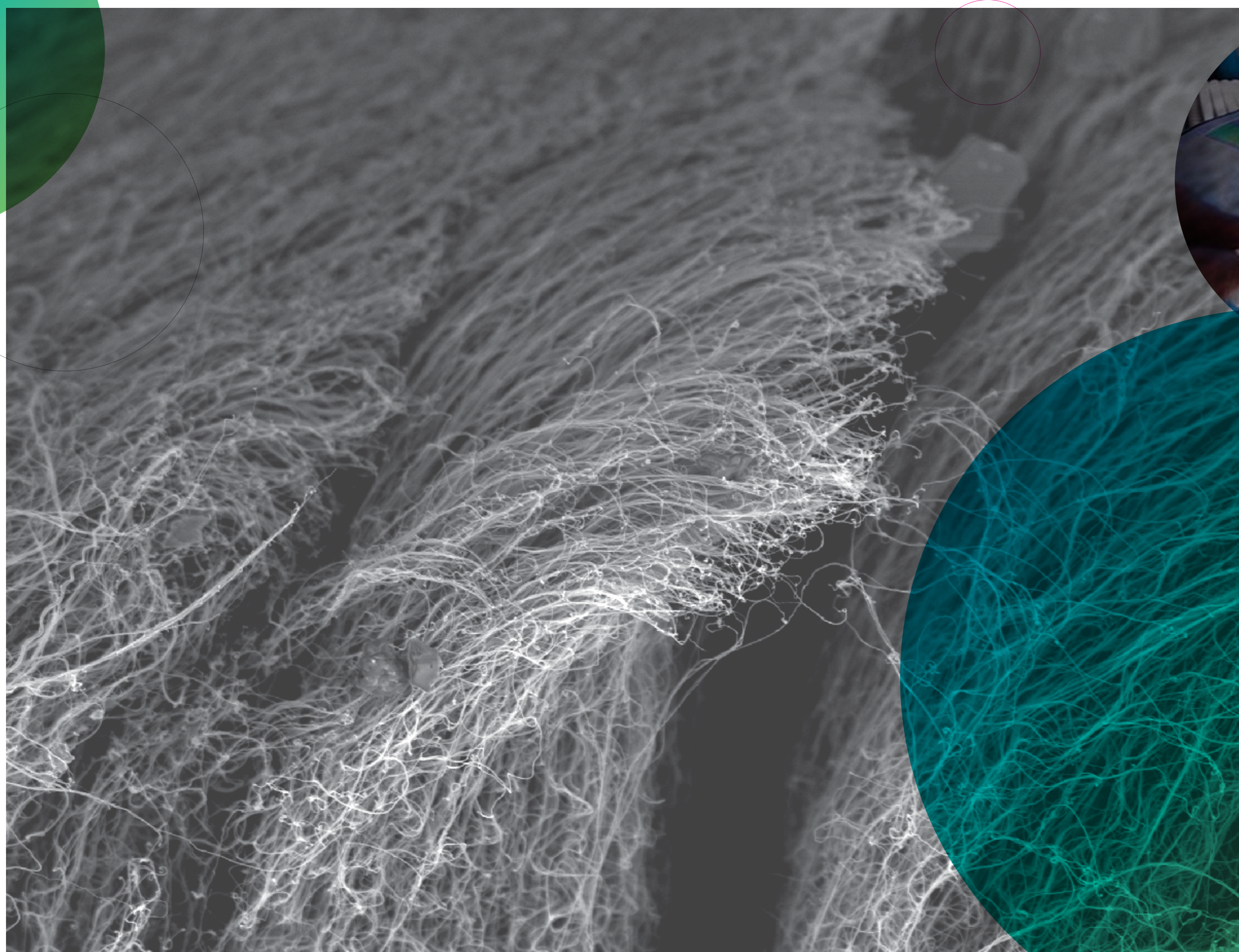


# DELIVERING FOR INDUSTRY HEWLETT-PACKARD



## INDUSTRY PROBLEM STATEMENT

HP is looking to develop a low-cost flexible, transparent, thin-film electrode. This is a critical component in the development of new electronic flexible displays that can be used for laptops, e-books and other electronic devices which are ultra thin, flexible, lightweight and have low power consumption.

## CRANN VALUE ADD

CRANN has internationally leading expertise in the synthesis, functionalisation and characterisation of nanomaterials and the processing of these nanomaterials to fabricate devices. To respond to the HP challenge, through SFI funding, CRANN brought together a team of twenty researchers in partnership with four HP researchers. This team combined a diverse range of expertise from nanomaterial synthesis and characterisation, thin film processing and characterisation, mechanical, optical and electric testing and the integration of the electrode into prototype devices.

The programme integrates the research activity at CRANN and HP Ireland with HP's technology roadmap to develop flexible transparent displays utilising low cost manufacturing. This strategy has enabled HP Ireland to partner with, and directly harness, the ongoing research capability at CRANN and to develop its mandate as a leading solution provider within HP globally.

The CRANN-HP partnership has led to significant programme funding from HP in the US and SFI, which will lead to the commercialisation of cutting edge products. The collaboration has already produced outstanding results leading to both research publications and the filing of intellectual property at both CRANN and HP. The CRANN-HP team is now the international lead in terms of the thin

film electrodes it can produce. These electrodes have been used to manufacture prototype displays from a range of different technologies across the HP organisation.

This research will transfer to HP over the course of this programme to enable new products, process improvements and commercially relevant technological advancements. This programme will continue to ensure high quality sustained research activity in Ireland, a key factor in enabling HP activities both locally and globally.

## CRITICAL CRANN ENABLERS

- Nanomaterial synthesis, processing and characterisation.
- Mechanical, optical and electrical testing of thin films.
- Scanning electron microscopy (SEM), scanning tunnelling microscopy (STM) and atomic force microscopy (AFM) to provide insight into nanotube and nanowire interactions.
- Spray, filter and spin-coating deposition of thin films from solutions.