Abstract Title: Sustainable Organic Electronics

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Consumer electronics, besides having caused an unsustainable amount of electrical and electronic waste (e-waste), is also an energy and material intensive industry.

As the world continues to place greater emphasis on sustainability, researchers are increasingly turning their attention to organic materials in an effort to reduce our reliance on traditional electronic components, better product end-of-life management and develop energy-efficient processes. These organic materials can include conductive polymers, organic semiconductors, and other carbon-based molecules that possess unique electronic properties.

Key advantages of organic electronics (OE) include: i) flexibility and lightweight nature of the C-based materials employed, thanks to which final products can be flexible, rollable, stretchable and be applied to nearly any surface; ii) energy and material-saving manufacturing; iii) by taking advantage of the unique properties of carbon-based chemistry, possibility of using biodegradable and/or biocompatible components and iv) employ energy-saving wet processing when formulated as printable electronic inks.

As the demand for greener, more efficient, and versatile electronic devices will only continue to grow, OE could play a critical role in meeting this demand. However, despite the exciting potential of OE, there remain several challenges that must be addressed to fully unlock the capabilities of this disruptive technology. For example, the need for improved performance, stability, and durability of organic electronic devices; or the development of specialised processing.

In this seminar we will survey the current status of OE, showcasing examples of our group for application in display, next-generation packaging and data storage, and discuss the interdisciplinary strategies scientists are focusing on to tackle the lingering challenges.