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Electronics On the Brain

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ABSTRACT:

One of the most important scientific and technological frontiers of our time is the interfacing of electronics with the human brain. This endeavour promises to help understand how the brain works and deliver new tools for diagnosis and treatment of pathologies including epilepsy and Parkinson's disease. Current solutions, however, are limited by the materials that are brought in contact with the tissue and transduce signals across the biotic/abiotic interface. Recent advances in electronics have made available materials with a unique combination of attractive properties, including mechanical flexibility, mixed ionic/electronic conduction, enhanced biocompatibility, and capability for drug delivery. I will present examples of novel devices for recording and stimulation of neurons and show that organic electronic materials offer tremendous opportunities to study the brain and treat its pathologies.

BIOGRAPHY:

George Malliaras is the Prince Philip Professor of Technology at the University of Cambridge, UK. He received a PhD from the University of Groningen, the Netherlands and did a postdoc at the IBM Almaden Research Center. Before joining Cambridge, he was a faculty member at Ecole des Mines in France and at Cornell University, and served as the Director of the Cornell NanoScale Facility. His research has been recognized with awards from the New York Academy of Sciences, the US National Science Foundation, and DuPont, and an Honorary Doctorate from the University of Linköping in Sweden. He is a Fellow of the Materials Research Society and of the Royal Society of Chemistry and serves as Deputy Editor of Science Advances.