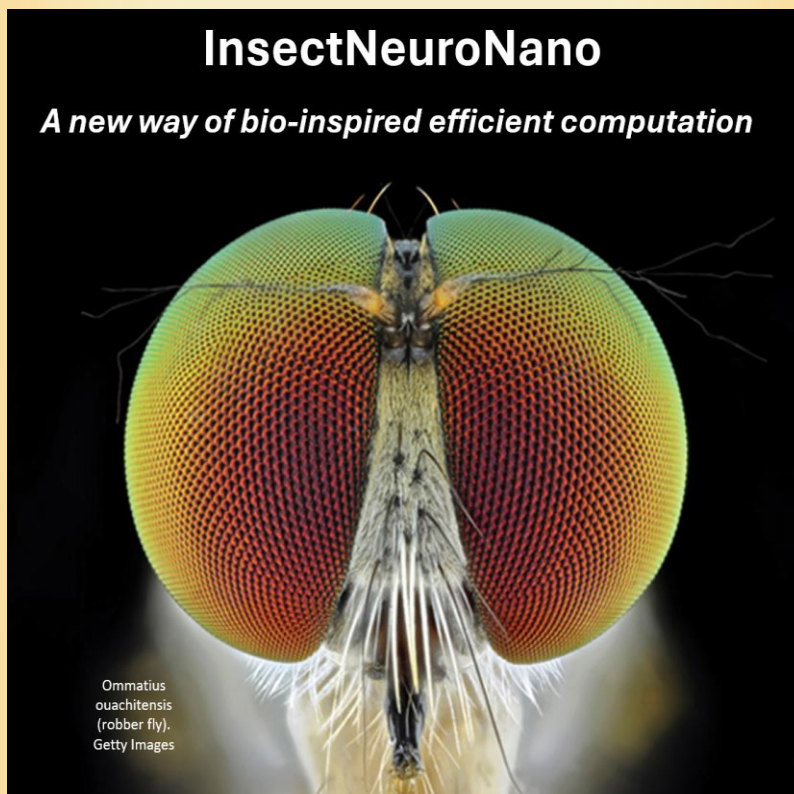


Colóquio de Física CFUM , LIP Minho, DF

Terça-Feira, 25 de Março às 15:30h
Anfiteatro de Química, Escola de Ciências, Gualtar

InsectNeuroNano: A new way of bio-inspired efficient computation

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Internacional de Nanotecnologia**



Resumo:

Inspired by nature, neuromorphic (brain-like) systems are designed to efficiently process analog inputs in complex, real-world environments. These systems hold the potential to enable ultra-low-power, in-sensor intelligent edge AI computing. Here, we present an artificial sensory neuromorphic platform inspired by the insect brain. It comprises artificial sensory oscillator neurons based on III–V semiconductor nanopillars, which possess both light-emitting and photosensitive capabilities. These oscillatory optical neurons dynamically transform incoming analog optical signals into spatiotemporal oscillatory patterns. These spatiotemporal oscillatory patterns (burst firing) are fundamental to the integrated sensing, pre-processing, and encoding functions of the insect vision-nervous system. This work lays the foundation for next-generation artificial AI computing systems powered by semiconductor nanophotonic circuits. Potential applications include light-driven neurorobotics, bioinspired optoelectronics, and in-sensor neuromorphic AI computing for real-time sensory data processing.