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University

## **MQ Photonics Research Centre Seminar**

**Wednesday, 15 September 2021, 2:00 pm (Sydney time)**  
**(Online via the zoom link below)**

### **Dynamics of a cell's mass: a powerful indicator of cell physiology**

**Dr David Martinez Martin**

**The University of Sydney, Australia**

#### **Abstract:**

Cell growth, understood as the dynamics a cell's mass over time, is a fundamental process for all living organisms. Yet it is poorly understood. A better understanding of how cells regulate their mass can enable us to transform the way we diagnose, monitor, and treat disease. I will introduce a new technology (picobalance) that we have developed, which is based on an optomechanical micro-resonator. It measures the mass of single or multiple adherent cells in culture conditions over days at millisecond time resolution and picogram ( $\sim 0.1\%$  of cell mass) mass sensitivity. This technology allows measuring cells' rheological properties. This approach is fully compatible with state-of-the-art optical microscopies, allowing to correlate cell mass and cell mechanics with cellular morphology and state.

#### **Speaker biography:**

Dr David Martinez-Martin is a physicist, Senior Lecturer in Biomedical Engineering, and co-chair of the sensors and diagnostics cluster of the Nanohealth Network at the University of Sydney. He is also the co-founder and co-convenor of the Summer Innovation Program (now renamed Sydney Innovation Program). His research focuses on finding new biomarkers for health and disease, and cell physiology, which in many cases requires him to develop his own instrumentation. He is an expert in nanotechnology, single molecule, and cellular biophysics, and scanning probe microscopies.

URL to join: <https://macquarie.zoom.us/j/85829287435>

Dial-in phone line: +61 2 8015 2088, Meeting ID: 858 2928 7435

