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Type: Oral Presentation

## NON-SPECIALIST LECTURE: Trapped ions for new frontiers in precision measurement

Thursday, 7 July 2016 11:30 (40 minutes)

**Abstract content** (Max 300 words)  
**Formatting & Special chars**

Ultra-cold, trapped atomic ions have over decades yielded ground-breaking results in spectroscopy, atomic clock physics, and fundamentals of quantum optics. Modern trapped-ion experiments have led to the creation of tunable quantum simulators of quantum magnetic phenomena, implemented many key steps in the march towards the creation of a general purpose quantum computational device, and more recently heralded in a new research field of ultra-cold molecular ion chemistry. In this talk we discuss the first laser-cooled trapped-ion experiment in South Africa. In particular we examine the prospects for achieving new regimes of precision in trapped-ion atomic clocks based on unsharp measurement protocols that overcome fundamental challenges limiting clock precision in current methods.

**Apply to be considered for a student award (Yes / No)?**

No

**Level for award (Hons, MSc, PhD, N/A)?**

N.A.

**Main supervisor (name and email) and his / her institution**

N/A

**Would you like to submit a short paper for the Conference Proceedings (Yes / No)?**

No

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Yes

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