Contribution ID: **163** Type: **Invited Oral**

# Micro mercury ion clock with frequency stability performance comparable to that of rack mount Cs frequency standards

*Friday 20 October 2023 09:00 (30 minutes)*

As communication and navigation systems increasingly rely on precise timing signals from atomic clocks, the interest in smaller and more power-efficient clocks has grown in recent years. However, achieving high performance in clock frequency stabilities while reducing size, weight, and power (SWaP) has proven to be a challenge. Surveying existing atomic clocks in use clearly shows a stubborn trade-off [1]. Improving clock stability means a higher number of atoms, better vacuum conditions, higher laser powers, and more complex system control, all of which inevitably result in larger sizes and higher power consumption. In this paper, we will present the development of micro mercury trapped ion clocks (M2TIC) that clearly broke away from the typical trend.

[1] Marlow, B. L. S. & Scherer, D. R. A review of commercial and emerging atomic frequency standards. IEEE Trans. Ultrason. Ferroelectr. Freq. Control 68, 2007–2022 (2021).

**Author:** YU, Nan (JPL, CalTech)

**Presenter:** YU, Nan (JPL, CalTech)

**Session Classification:** Compact Clocks

**Track Classification:** Miniature, Portable and Space Systems