

# THE PHYSICS COLLOQUIUM

Thursday 17 October 2024, 4:00 p.m.  
Nijenborgh 4, Lecture Hall 5111.0022

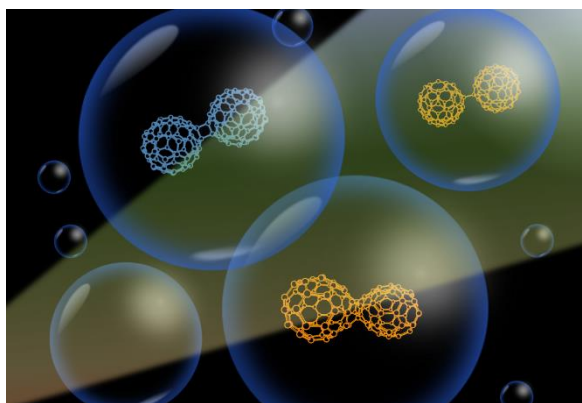
## Probing singly and multiply charged molecular ions within helium nanodroplets

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Helium nanodroplets are an exciting and versatile matrix for trapping and cooling dopants from the gas phase. They offer the unique opportunity to study the spectroscopic properties of cold atoms, molecules and clusters - both neutral and charged - at temperatures below 1 K. In addition, these droplets also enable the stabilization and investigation of transient and metastable species, which are often difficult to study in conventional experimental setups due to their short lifetimes.

In this talk, I will explore how highly charged helium nanodroplets [1] can be used to efficiently form singly and multiply charged molecular ions, which we characterize using mass spectrometry [2]. In addition, I will present new techniques that we have developed to gently extract these molecular ions from the helium matrix, enabling the formation of helium-tagged molecular ions [3,4]. These tagged ions are particularly useful for messenger spectroscopy as they allow us to perform electronic and ro-vibrational spectroscopy on cold molecular ions with minimal interference from the helium tag.



*Join us for coffee starting 3:30 p.m. Refreshments will be served after the lecture.*

For more information contact the host: Thomas Schlatholter ([t.a.schlatholter@rug.nl](mailto:t.a.schlatholter@rug.nl))

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