

*Abstract for invited talk*

## Collisions Involving Positronium

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Recent developments in the production and scattering of the Positronium beam at UCL will be reviewed. The Positronium beam is formed through the charge-exchange reaction of a positron beam within a suitable gas target, utilizing the forward peaked nature of the differential Positronium formation cross-section. Results for the production efficiency of converting a positron into a Positronium beam will be compared for a number of atomic and molecular targets [1-3].

Total cross-sections for Positronium scattering have been measured for a number of simple atoms and molecules [1,4], as well as the fragmentation cross-section of Positronium collision with He atoms [5]. The longitudinal energy distributions of the residual positrons from Positronium fragmentation have also been determined and found to be strongly peaked at half of the residual energy, indicating the occurrence of electron-loss-to-the-continuum. Corresponding investigations of the ejected electrons are underway. Comparisons will be made with theories where available.

With knowledge of both the positron and Positronium total scattering cross-sections and the measurement of the Positronium detection efficiency, absolute differential Positronium formation cross-sections have also been extracted from the Positronium beam production efficiency measurements [6]. Comparisons with theory are made where applicable.

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In Preparation