The Savin group has long-standing expertise in reactive scattering studies involving neutral atoms and atomic or molecular ions. The measurements are performed using either a single-source or dual-source merged-fast-beams apparatus, enabling us to measure absolute integral cross sections (ICSs) for translational collision energies $E_T$ from ~ 2 meV to ~ 20 eV. In recent years we have measured the reactive scattering ICS for associative detachment of $\text{H(D)} + \text{H(D)}^- \rightarrow \text{H}_2(\text{D}_2) + e^-$ [1-4], proton- and $\text{H}_2^+\text{-transfer from H}_3^+$ onto C and O [5,6], and isotope exchange of D with H$_3^+$, H$_2$D$, and D$_2$H$^+$ [7,8]. Our studies are motivated by astrophysical questions, but the techniques and some of the reactions are also relevant for fusion studies. In my presentation, I will discuss some of our recent work, illustrating our experimental capabilities, and highlight some of the shortcomings in state-of-the-art reactive scattering theory.

References


