Comet 45P – A case of nature vs. nurture

- 45P is a Jupiter-family comet with a close perihelion distance ($R_h \sim 0.5$ AU), small size, and an active surface.
- These characteristics suggest extensive heating and erosion since its formation.
- However, 45P has high abundances of the most volatile organics (CH$_4$ and C$_2$H$_6$) suggesting retention of primitive chemistry.
- Additionally, high abundances of saturated vs. unsaturated hydrocarbons (e.g. CH$_3$OH/H$_2$CO and C$_2$H$_6$/C$_2$H$_2$) suggest pre-cometary ices were formed by low temperature grain surface chemistry prior to incorporation into the nucleus of 45P.

Comet 45P retains its primitive character despite intense heating and erosion