

Exocomets 2019: Summary Day 1

- *comets may not be as pristine as we thought*, “new” ones beyond 40000 au; large massive comets could undergo interior composition changes due to radioactive heating
- comets come in various “families/types” and it is *unclear if/how these relate to what we observe in other systems – activity levels, sizes, composition*
- the distinction between gas and solids in comets is “sliding” since it depends on distance to the Sun (sublimation temperatures of ices, organics and refractories vary) and the observing method; *also the fraction of carbonaceous material (organics?) seems higher than silicates*
- exocomet work currently revolves around very few objects and one molecule (CO), β Pic being a central system; use of firm criteria for checking whether to call something an exocomet (co-spatial gas+dust, H-poor, detailed gas composition etc.)
- quantitative and qualitative interpretation of comet spectra involves understanding the parent/daughter pathways as well as detailed excitation mechanisms – key molecular data is still missing (e.g. e- impact dissociation)
- comet history: material inherited from molecular cloud and processed in protoplanetary disk to a certain level of complexity (presence of several ice lines, radial and vertical mixing), then later post-disk processing through stellar winds, radiation etc.
- access to ice composition from disks often very indirect through observing complementary gas phase, except close to edge-on systems (ice in absorption) or few bright sources (ice in emission)

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Open questions:

1. Is exocomet a good term to use or should we re-visit this? **PotCom, planetesimals, ...**
2. Comets in the Solar System can be measured with different techniques/sensitivity than exocomets – **need to compare them e.g. emission vs absorption, perihelion distance (excitation)**
3. Comets orbit around the Sun, an active G-type star with a wind and magnetosphere, all of which play a role in comet activity and interpretation of observations – **how does this compare to exocomets mostly claimed around “younger” A-type stars?**
4. Should we expect to detect also molecules other than CO in exocomets? **Need to check, see point 2, also links to point 3**
5. Are the “things” (e.g. variable absorptions, photometric dips) we witness around other stars really exocomets? **links also to point 1**