Round table about observations

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What are the typical steps when setting up a proposal?

- How long to start in advance of the deadline?
- Science goals? Is it better to ask broad questions or smaller questions that can be answered by the foreseen experiment?
- Feasibility?
- Choice of instrument?
- Compromise?

Interpreting data of nearby galaxies based on our knowledge of the Milky Way

- Problem of sensitivity: Are we biased in nearby galaxies by the limited sensitivity?
- The geometry problem
  - How to tackle mixing of different environments along a pencil beam line of sight? Mixture of dust properties, dense vs diffuse environment, …
  - How to bridge the angular resolution gap vs exquisite details of knowledge about the Milky Way
    - Maximum size sampled in our galaxy vs minimum size sampled in nearby galaxies?
    - Impact of mixing phases?
- How do we deal with the diversity of conditions in Galaxies
  - Metallicity;
  - Galaxy environment (dynamic, mixing of component);
  - Main sequence vs non-main sequence;
  - Which physical/chemical process dominates?
- Are there open questions in the Milky Way that are critical for the studies of nearby galaxies?
- Are multi-wavelength observations useful? How to deal with different angular resolutions?
  - Visible, IR, mm, sub
  - X, gamma (role of IGM)
  - SKA (which resolution will we bring)

Only remote sensing => Absence of Observational Ground Truth

- How do we know that we achieve truth?
- Which observations can discriminate between physical and chemical processes?
- Can we consider some unknown physical/chemical parameters as just an additional source of noise?
- What is the impact of imperfect data reduction? Should we go to models taking into account observation imperfections?

Machine learning, statistical analysis, and benchmark sources

- How to characterize large datasets?
- How to find unforeseen interesting trends?
- In a proteiform medium as the ISM, how to distinguish between signal and bias?
- Are statistics the only way forward? Are there GMCs or galaxies that can be used as benchmark sources?

On the need of laboratory astrophysics

- Do we need laboratory astrophysics to understand ISM?
- Is laboratory astrophysics any useful to study nearby galaxies only resolved at 10-100 pc?
- Can we use galactic dust models in nearby galaxies? Same basic chemistry/physics? Same dust components with the same relative abundance as in the MW?

Why do we need any / new observations?

- Did we analyze all the existing data? What is the use of archives?
- Which new observations? Why these ones?
- How to defend the new observing facility for ISM in MW and nearby galaxies?
- Can we do time astronomy in ISM science?