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Complex processes in simple ices : laboratory and observational studies of gas-grain interactions during star formation

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Stellingen associated with the thesis

Complex Processes in Simple Ices

Laboratory and observational studies of gas-grain interactions during star formation

1. Ice formation is sequential during star formation, with more source-to-source abundance variation the later in the sequence an ice forms.
Chapters 2, 3
2. Relative diffusion barriers govern the thermal evolution of thin ice mixtures.
Chapters 5, 6
3. UV ice photodesorption has a high and almost constant yield for most common interstellar ices.
Chapters 7–9
4. Observations of complex organic molecules in comets and around protostars are readily explained by ice photochemistry.
Chapters 10, 11
5. To extrapolate ice dynamics from laboratory to astrophysical timescales requires experiments that constrain elementary processes.
6. Molecular ratios in exo-planetary atmospheres may become the strongest constraints available on when and where exo-planets form.
7. The imminent avalanche of observational data from e.g. ALMA should prompt a re-discovery of the principal component analysis.
*Pearson, 1901, *Philosoph. Mag.*, Vol. 2, No. 6., p. 559*
8. A closer connection between astrochemistry and astrophysics would benefit both fields.
9. It is the tragic duty of scientists to do their best to kill off their own pet theories.
10. Historical writings often reveal more information about the time of their production than the time of their topic.
11. To do exciting research is to embrace feeling stupid.
12. The truth cannot be determined by a majority vote.

Leiden, September 16, 2009
Karin Öberg