# X-ray spectroscopy of merging galaxy clusters

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*Propositions accompanying the thesis*

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1. Background modeling in X-ray observations is a complex process, which should be standardized in order to minimize the systematic effects over the low surface brightness regions such as the galaxy cluster outskirts. (*Chapter 2, 3 & 4*)

2. Shocks with Mach number $M \geq 3$ support the diffusive shock acceleration (DSA) scenario. (*Chapter 2 & 3*)

3. Signatures of 'cool-core remnants' after a strong merging activity are found more often than was assumed. (*Chapters 3 & 4)*

4. An abundance of $\sim 0.3\ Z_{\odot}$ together with the lack of correlation between Fe abundance and entropy in the cluster outskirts may be additional evidence in favor of the pre-enrichment scenario. (*Chapter 4*)

5. Significant funding for updating plasma codes is needed to make XIFU, the future X-ray high spectral resolution instrument, aboard Athena a success. (*Chapter 5*)

6. Systematic uncertainties are too often overlooked in astrophysics, which leads to biased results.

7. Space agencies should take more technological risks to achieve outstanding scientific advances. Cases such as the XEUS mission (formation flying satellites), modified to IXO (large deployable structure) and finally reduced to the Athena satellite, should be avoided.

8. Short-term, cost-effective and dedicated small satellites such as cubesats are the optimal solution to fill the scientific gap before L-class missions.

9. All scientific groups need at least one engineer in their teams in order to constrain the entropy of their projects.

10. Teaching and supervising skills of supervisors are as important as learning and working skills of students for the success of their projects.

11. To cuddle and stroke affectionately a cat for at least 10-15 minutes every day reduces the stress level during a PhD.

12. After 5 years in The Netherlands, I still cannot figure out what Dutch people are looking for in all the holes, works and constructions over the whole country. I wish them all the best in the treasure hunting.

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