

STSM Scientific Report

The purpose of this visit was to get in touch with the experimental host group to become more acquainted with the procedures and the apparatus which are currently used in state-of-the-art experiments. Although my attention was initially focused on experiments concerning biomolecules embedded in helium droplets, during my two-week stay I also joined different people which were carrying out other experiments in order to learn more about the different aspects of the analysis of molecules like amino acids and DNA basis.

I spent my first week in learning how the experiment is practically set up: which are the components of the apparatus and how they work, and which are the problems that can be encountered in tuning and executing the experiment.

At the end of the week I have been asked to give a seminar for the group in which I have illustrated the work that we have carried out in Rome about the helium clusters.

The second week was mainly spent in working on the CH5 machine which is the one dedicated to the experiment with the helium droplets. I followed all the steps that precede the execution of the experiment: like the assembling of the machine components and the alignment of the cluster source beam. In this phase, I have found very interesting to see how to link the problems in the trial spectra to malfunctions of some of the component of the apparatus and how to solve these problems. Finally, at the end of the week I saw the first spectra about Valine in helium droplets.

Working side by side with experimental people has been very useful for me, so I could see a different way to do physics and chemistry: how the experimentalists work, what are the limitations of their procedures, which are the main problems they encounter and how to solve them and, especially, which are the results they can obtain and how they get them from the output signal of the machines. I have had a lot of conversations with the people in the group about how to find a way to support their results with theoretical studies in order to clarify the aspects which remain obscure after the experiments.

A fruitful future collaboration between the two groups is envisaged in order to present to the scientific community more complete results about the analysis of biosystems. For this reason a considerable exchange of data has been already started.