



MARSHALL PLAN SCHOLARSHIP FIELD REPORT AFTER STAY

Please complete the report form on the computer and send it in word-format and PDF-format to christa.grassauer@uni-graz.at.

PERSONAL DETAILS

First name	Oliver	Middle name	
Last name	Orasch		
Research period at host university, min = 3 full months excl. arrival and departure day			
From (DD.MM.YY)	04.02.2019	To (DD.MM.YY)	07.06.2019

FINAL FIELD REPORT (2 pages)

Please comment on the following topics concerning your stay at the host university:

General impression of your research stay

During the period stated above, I was at Duke University in Durham, North Carolina. Primarily, I worked with Prof. Shailesh Chandrasekharan.

Regarding academic collaboration, my stay at Duke was very fruitful. Through the interaction with Prof. Chandrasekharan and his students, I was able to learn and develop novel techniques which we will extensively use for the research our group is interested in. The collaboration at Duke was twofold: With Shailesh Chandrasekharan I discussed algorithmic ideas for worldline simulations. Since he did pioneering work in this field, it was the optimal mixture of learning techniques from an expert and simultaneously developing (through discussions with my host) new ideas for my research interests. Regarding the interaction with the students, I attended many (in)formal seminars and discussion groups where rather broader topics, not techniques, were covered. These gatherings helped to broaden my scientific horizon and deepen my understanding in some regards.

Since the Physics Department at Duke is a place of diverse research, many talks were given by external speakers. For example, I attended talks on topics such as machine learning, quantum computing, black holes, and experimental particle physics. These topics do not have a huge overlap with my research interests but it was still informative, and I could take away some things for my work. Also, many informal seminars were given by faculty members which I enjoyed very much.

Overall, I have to state that both on a scientific and personal level I benefited a lot from my months abroad. The experience was rather unique and I thank the Marshall Plan Foundation for making it possible.

Quality of the host institution in regard to research opportunity

Duke University is well-renowned institution, and so is the Physics Department. Thus, the faculty includes excellent physicists of many fields of expertise. On my part, I was associated with the "Lattice and Effective Field Theory" group where the principal investigators are Roxanne P. Springer, Thomas C. Mehen and Shailesh Chandrasekharan. The latter was the host for my stay.

Prof. Chandrasekharan is an expert and pioneer in the field of Monte Carlo simulations with fermionic content which is exactly the main focus of my PhD thesis. The interaction with him and his students posed to

be valuable input for my research interests.

The department provided a desk in a two-person office and free office supplies. Moreover, for my simulations, I was able to use the computational resources of the university which was more than sufficient for my needs.

Contact within the host institution, academic opportunity for academic collaboration during stay

The atmosphere in the Physics Department was very lively. As mentioned above, multiple times a week talks were held in both formal and informal settings. Especially within our group, we had frequent informal seminars where new insights were discussed.

Regarding my collaboration with my host, Shailesh Chandrasekharan, we had many scheduled, as well as spontaneous discussions. I could always stop by his office and share new ideas or results.

My research stay may result in three publications: The first paper is a conference paper based on a talk I gave at the 37th Symposium on Lattice Field Theory in Wuhan, China. The second will be a follow-up paper to the conference contribution that we plan to submit to a peer-review journal. Additionally, there is the option for a third paper where plan to focus more on the algorithmic part of this project.

Recommendations for future Marshall Plan applicants

Given my experience at the Physics Department, I recommend visiting Duke University. For a start, the contact with the Physics Department was very smooth and pleasant. They assisted me in getting my visa and helped me set everything up for my stay. Responses to my emails were super fast and the Assistant-to-the-Chair, Cristin Ryman, was eager to answer all my questions to the best of her knowledge. All in all, the communication with the Department of Physics and the university was uncomplicated and easy-going.

In addition to that, the mentality and academic setting at Duke is very stimulating. I can only speak about the physics community, but I can imagine that this is the case in other fields as well.