



Final report

Name of intern: Liudmila Silanteva (Lyudmila Silantieva)

Home University/Country: Kazan National Research Technical University, Russia (work);

Kazan (Volga region) Federal University, Russia (study)

Subject: Photonics

Guest University/Country: University of Warsaw, Poland

Name of supervisor: Mr Michał Mikołajczyk

Part 1. General information about

1.1 your application (motivation)

I am currently on my fourth year of the bachelor's degree at the Institute of Physics of the Kazan Federal University. My field of study is radiophysics, but since the beginning of my third year I have smoothly moved towards nonlinear quantum optics in my professional interests. Therefore, from autumn of 2019, I became an unofficial trainee in the Kazan Quantum Center. There I prepared my semester project and was subsequently hired as a laboratory assistant at the Laboratory of Photonics and Fiber Quantum Optics. I was struck by the photonic-crystal fibers, and I really like to study nonlinear and quantum processes, they seem to me mysterious and interesting. I found an advertisement of BARI program in Instagram, and decided to participate in it, because I thought it was a great opportunity to look at quantum photonics from different perspectives. Analyzing projects in BARI portal, I read articles by the supervisors of the laboratories. Scientific direction of one of them – the laboratory of Quantum Photonics in the University of Warsaw, seemed to me close to what I was learning in my lab in my country. It seemed to me as challenging as breathtaking! I believe that international experience gives you an opportunity to combine knowledge, allow you to stay creative and give birth to new ideas, drawing analogies or trying to connect something that you already know to what you are doing.

1.2 your preparation

My preparation to living and working abroad mostly consisted of preparing documents and getting VISA.

1.3 your travel

Travelling in the time of pandemic situation is very challenging! I couldn't get tourist visa or even student visa! I was only able to get visa "for work" as a specialist, not as a student. Hopefully, working in Kazan Quantum Center helped a lot. Also, my laboratory supervisor talked to Polish Embassy many times about my situation. Also, I lost a lot of money on travel expenses, as because of COVID-19 my straight flight back home was cancelled, and I had to buy new tickets through another country, which cost much more. Also, the air company didn't return money for cancelled flight.



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1.4 your accommodation

It was also hard to find cheap accommodation in Warsaw, Poland next to the University. Mostly, all people refused to rent a room for a short stay less than a half a year (I came to Warsaw for two months). Eventually, one person agreed to rent a room for two months, but if I pay more. The room was in 5 km from the University, and it took about an hour to get there. However, my accommodation was close to the one of the most beautiful places in Warsaw and I was even able to go there by foot.

1.5 your life in the host country

My life in host country was a bit challenging. I think it was challenging, because of pandemic. Because of the covid-19, everything (museums, theatres, cinemas, restaurants, even malls) was closed. Also, it was allowed only for two persons to work in the lab at one time. So for me it was very difficult to socialize and to find any friends. So, I felt myself lonely in the situation of this partly lockdown. However, I was able to walk around and see beautiful architecture in the downtown. Also, as I went to Warsaw in October – December, I had online classes in my home university. So my life in Warsaw mostly consisted from working in the lab full day three days a week, online-studying in Russian university at home, and doing sights seeing in the weekends.

Part 2 Information about the project and your tasks

2.1 Information about the research project (short description of the project and your tasks)

My project name was "Spectral-temporal engineering of quantum light". The main goal was to calculate second order Glauber correlation function via simulations and in experiment. At the beginning my tasks were related to measuring parameters of our laser, its characteristics were necessary for building optical setup later. So in the beginning I was gaining basic experimental experience. In parallel, I was also doing 3D-modelling of density filters holders for the setup. And my main task was developing a simulation in MATLAB of detecting single photons using three single-photon detectors and calculating second order Glauber correlation function.

2.2 your colleagues

As it was allowed only for two persons to work in the lab at one time, I mostly communicate only with my supervisor. He explained me many things very clearly, he also helped me if I struggled with the task. On Wednesdays we had lab meeting in Zoom with all colleagues, where everybody talked about what he was been doing during the week and where we discussed all the results. So, I communicate with the rest of my colleagues online.

2.3 the research institution

The laboratory where I worked as an intern was well equipped. I think what is the best about it is freedom of doing science you want.

2.4 your experience working within the project



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In the beginning it seemed to me that I was working slowly and poorly, despite the fact that I tried very hard. In almost no assignment I have succeeded the first time. Nevertheless, it turned out that this is normal in optics. Especially in an experiment, because the settings are very sensitive and it takes people years to set them up quickly. In the end, almost in the last days of the last week of my stay, I succeeded in the project.

“I agree that my report and accompanying pictures may be used in whole or in part by the BARI-Programme and its funders in printed materials, presentations, and on websites in order to inform funding organizations, sponsors, and students about the BARI programme.”

A handwritten signature in blue ink, appearing to be "Prof", is located below the text. The signature is written in a cursive style with a large initial 'P'.