

My PhD Journey

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It was in March 2018, while I was working as a Medical Physicist at Nepal Cancer Hospital and Research Center (NCHRC), Lalitpur, Nepal, I went to Bangladesh to attend and present my work on ICMPROI-2018. There I had an opportunity to meet and talk with Prof. Dr. Golam Abu Zakaria sir and Prof. Dr. Hasin Anupama Azhari madam about my interest for higher studies. They were my professors at Gono University, where I studied MSc Medical Physics. Prof. Zakaria, who is the founder of Department of MPBME at Gono University, is a leading figure for development of medical physics education in Bangladesh, is not just my professor but is a source of inspiration for many aspiring medical physicists. He is pivotal in creating learning opportunities for many radiation professionals and students in the region. While Prof. Anupama, to whom I have a huge respect as my teacher, was chairman of faculty of Physical Sciences and dean of Gono University, Bangladesh then. With them I discussed largely about my interest for PhD. It was indeed my initial step for undertaking PhD education.

As Prof. Zakaria keeps wide vision to support for the development of medical physics for South Asia, and there was a collaboration between Heidelberg University, Germany and Gono University, Bangladesh, to encourage and support PhD education under a sandwich program, I would get recommendation for PhD training in Germany under DAAD scholarship provided I get admission in PhD program in South Asia.

As I had deep interest to pursue PhD, the following stanza describes my mental state after having the conversation with the professors during ICMPROI-2018.



.....And there is a belief still alive

.....A consistent voyager keeps

...After traversing miles distance

.....Will reach a firm ground

.....Might it be a lonely land

.....But shall be rich in its beauty and shall be calm

Soon after returning to Nepal from the conference, I started exploring opportunities to get admission in PhD program. After weeks of exploration, I came across a PhD admission announcement in Amity University, India. Without delaying I applied to it, sat for and cleared the entrance exam, and took admission at Amity University, Lucknow, India. Meantime, as I was recommended for the PhD training in Germany, I started preparing for that. Prof. Dr. Asita Kulshrestha, HOI, ASAS, Amity University appreciated the effort and facilitated the process in Amity University matters.

PhD training in Germany started on August 2018, there in the beginning; I had opportunity to observe dosimetric work at Mannheim Medical Center. The chief medical physicist Dip-Ing Volker Steil at UMM helped me on different matters. I also had opportunity to learn about 3D printer there and also attended few vendor sessions. Also, I used to have frequent conversation with Prof. Golam Abu Zakaria on finalizing the research area. We had a lot of brainstorming on that. One fine day, Prof. Golam Abu Zakaria, Prof. Guenther H Hartmann, DKFZ professor and me had a long conversation at Heidelberg on possible research avenues. Finally, I decided to choose a topic on Monte Carlo Simulation, and both professors from Germany and Prof. Asita Kulshrestha from Amity University would support me in my PhD work. Thereof I started learning on Monte Carlo calculation methods with Prof. Hartmann and I was regularly communicating with Prof. Zakaria and Prof. Kulshrestha on my progress. By the end of December, 2018, I had made a sound understanding of Monte Carlo methods and it has been crucial in finalizing my research topic. Finally, my PhD research topic evolved as **“Monte Carlo Simulation of Silicon diode detector in Megavoltage Photon Beam”**. We modified few Monte Carlo programs necessary for our research work and ran the codes with some representative sample data we had at that at the time.



Thereafter, I returned from Germany at the end of December 2018, and started coursework in Amity University, Lucknow, India in January 2019. After clearing coursework exams and getting the final approval of the topic from research committees of the University, I undertook the practical part of the PhD research. It was followed by

measurements with different small field detectors, which I received directly from PTW, Germany upon request from my Professors. It took me sometimes to get the custom clearance, but as soon as I received them, I performed the measurement and collected data. Meantime, better understanding dosimetry techniques particularly on small field dosimetry and Monte Carlo codes and their uses were made through extensive literature surveys and research works. While I was doing research directly under the guidance of Prof. Kulshrestha and Prof. Golam Abu Zakaria, regular communication, suggestions and support from Prof. Hartmann had been very helpful throughout.

Every six month, I presented my progress at university, and in between, somehow, Covid outbreak slowed the work progress but I kept the pace as far as possible. I presented the work in SFO Kathmandu, AOCMP Bangladesh, AOCMP Thailand and AOCMP Malaysia where I was awarded with **Professor Sung Sil Chu AFOMP Best Student's Publication Award**. I have been able to publish two quality papers in Radiation Physics and Chemistry Journal and Polish Journal of Medical Physics and Biomedical Engineering in 2023 and 2025 respectively. Thereafter, initially I prepared Long Abstract, got it Plagchecked and did pre-PhD viva, only then I prepared the final report, again got it Plagchecked and finally defended in November, 2025. In every step, suggestions from the guide, co-guide and Prof. Hartmann had been crucial.

My PhD work is particularly significant as it has been able to simplify Monte Carlo dose profile calculation with a novel “**Hypothetical In-Air Profile Method**”, at the same time could suggest profile correction factors for different detectors, could develop Analytical function for profile correction factors to minimize extensive MC calculation in clinical settings.



The PhD journey which I started on 2018 ended on December 6, 2025 as I was awarded PhD degree during a Convocation Ceremony at Amity University, Noida, India, which was conferred in the glorious presence of university academicians,

Union Minister of India Mr. Piyush Goyal and eminent scholars. I feel proud to stand as the **second medical physicist with PhD degree** working in the country. I am thankful to Prof. Golam Abu Zakaria, Prof. Guenther H Hartmann and Prof. Asita Kulshrestha for their unwavering academic guidance and support, while I thank Prof. Hasin Anupama Azhari for her kindness and support in my journey. I thank DAAD Germany for the prestigious scholarship, German Cancer Research Center (DKFZ), Germany for the resources and PTW Germany for the detectors, Mannheim Medical Center, Nepal Cancer Hospital and BPKMCH being the part of the journey. I highly acknowledge Amity University and its staffs for being there along with me in the journey. I value the perseverance and belief of my parents, wife, family members, relatives and friends to wait to see for the success. With the accomplishment, on one hand, I can feel a sigh of relief and on the other hand, a greater sense of responsibility and eagerness to undertake new research, scientific and academic activities.

To conclude, as in aforementioned stanza, my belief is still alive to work more on research,



scientific and academic activities. The PhD journey was as long as miles long journey but I have reached to the state of transient calmness after being conferred with PhD degree. Now I landed on a firm ground as a second medical physicist working in Nepal with PhD. Nevertheless, my doubt about whether it be a lonely land will not be lonely anymore, as more medical physicists will embrace the path to

celebrate each-others' success and do justice to medical physics profession and then serve patients, nation and above all the humanity. Now, I can tell everyone that my PhD journey was truly beautiful.