

SUMMER OF A LIFETIME! RESEARCH SCIENCE INSTITUTE AT MIT, BOSTON



As I sit to write this report on the Research Science Institute (RSI), I reminisce about the events of the past six weeks in a vain effort to describe just the most important aspects of the programme; each and every moment of my experience was so fulfilling and memorable that I cannot bear to leave anything out!

RSI is an annual summer research programme for high school students conducted at the Massachusetts Institute of Technology. This year, it was held from June 23 2018 to August 4 2018, and I was fortunate to be one among the 81 students from all over the world who had the amazing opportunity of taking part in it.

The primary objective of RSI is to inculcate and develop an interest in scientific research among students. To this end, during the first week, we had lectures in two subjects of our choice. Having chosen mathematics and engineering, I learned much about topics well outside our school curriculum, including number theory, game theory and elliptic curves, and even witnessed a live demonstration of an engineered go-cart made with the help of motors. Besides these two STEM subjects, humanities was also made compulsory for all the students in order to give us an insight into human society from a non-scientific perspective.

The second week saw us meeting our respective mentors and beginning our research projects. My project was in the area of machine learning; specifically, it was an application of a subset of machine learning known as active learning in the field of photonics. Over the next four weeks, I used and compared different learning algorithms to predict a certain type of light scattering by nanoparticles, known as 'Mie scattering'. I learned much through this project, about my particular topic and those of the other students, as well as about the process of research and scientific inquiry in general.

Another skill that we developed during RSI was the art of writing scientific papers and making effective presentations. At the end of every week, we delivered a talk which highlighted our progress in our projects, and also submitted a draft of our papers. Day by day, we improved our adeptness through useful suggestions provided by our tutors. At the end of RSI, we all turned in our final drafts and made our presentations to an audience consisting of all the students, as well as the tutors, TAs, mentors, RSI alumni and a panel of judges. I was really surprised and elated when my name was called out as one of the **top five** in both the oral and written presentations!

Besides the research project, we also had evening guest lectures by various eminent personalities throughout the course of RSI, including Nobel Laureates, founders and CEOs of multinational companies, and renowned researchers and professors from MIT, Harvard and other universities. I also had the opportunity of having dinner with some of them, including Dr. Wolfgang Ketterle and Dr. Noam Elkies, enabling me to pick their brains and get an insight into how they think and work.

However, besides all these organised activities and events, one aspect of RSI that made it truly special, in my opinion, was the opportunity to interact with the other students from all over the world and build a strong network of scientifically minded companions that will last an entire lifetime. RSI taught me that science has no barriers—linguistic, regional, cultural or otherwise. The time spent playing midnight Ultimate Frisbee, camping outdoors on a tarp on the Fourth of July, competing to win the coveted counsellor group cup, and discussing complex math problems made all 81 of us very close to each other, so much so that none of us wanted to leave when RSI finally drew to a close.

I would like to thank Dr. (Mrs.) Y. G. Parthasarathy and the PSBB school management for not only giving me this wonderful once in a lifetime opportunity, but also sponsoring my stay through the 'Mrs. YGP scholarship'. I am also very grateful for having the support of all my teachers and for their constant words of encouragement.

RSI was truly a dream come true. I can confidently say that these six weeks will remain the most amazing, memorable and exciting six weeks in my life for a very long time to come!



By,
Tarun Prasad XII – B

Reporter,
Cyber Pigeons, PSBB NGM.