



Al Hasanat Rasul  
Editor-in-Chief

## NPTC-NSTC-Alumni Association and NAAM

The progress of a nation depends on its people, especially its youth, who learn from their past, care about their fellow citizens and are concerned about their coming generations. So, if we wish to survive as a proud and prosperous nation, we should start thinking along these lines. Science, Technology and other emerging scientific fields are the main ingredients that will lead us to a better future. In this regard, National Physics Talent Contest, National Science Talent Contest, Alumni Association and NSTC Alumni Association Magazine are endeavours which I hope, will encourage the youth of Pakistan to actively participate in scientific and research related activities. Scientific & technical knowledge are the main contributors towards a nation's wealth and national security. In order to solve challenges, like unemployment, poverty, global warming and climate change, the inhabitants of a country must possess at least the basic scientific know-how and knowledge of how to deal with such challenges; we as Pakistanis lag far behind in this respect.

It was 31<sup>st</sup> May, 1997, when we had our last exam of F. Sc. After 12 years of tiring studies we finally got time to relax until we pursued our careers in our desired fields. However, our relaxation was interrupted by the screening test for the first National Physics Talent Contest (NPTC) which was held on the 1<sup>st</sup> of June, 1997. Initially, we were not really in the mood to take the test, but later planned to go for it. I, along with four other students who were nominated by our college, took the test without preparation, and surprisingly got selected. It was unexpected as we had never been high scoring students.

The training camp for NPTC was held in August, 1997. It was an experience of a lifetime, as physics, which has always been my passion, had become an important part of my life due to the amazing teaching-training process at Pakistan Institute of Engineering and Applied Sciences (PIEAS). The insightful visits to Research Atomic Reactors, Optics Labs and labs where the equipment of Al Khalid Tank was developed, made us realize the importance of science and its applications. The teachers left a strong impact on most of us and it was an experience that we will cherish forever. We understood the Einstein's quote; "*The process of scientific discovery is, in effect, a continual flight from wonder!*"

After three years of continuous efforts, with alumni like Saleh Bin Tariq of NPTC-1, Mehreen Alam of NPTC-3 and Seemal Mumtaz of NPTC-3, we were able to convince Dr Abdullah Sadiq, the then Rector PIEAS and Current Chair STEM Careers Project, to form an Alumni Association of the participants of the various NPTC's. It was during the year 2000 that Dr Abdullah Sadiq formally established the Alumni Association whose main aim was to spread the message of NPTC and to encourage bright students to pursue science as a career. The idea was to reach students in the farther areas of the country and educate them about the importance of science, especially the basic sciences. I was captivated by the idea of working for our people who lag far behind even in basic education, let alone science and technology. This is not because people are indifferent to, or not interested in acquiring knowledge, but because they are unaware of the opportunities available. It is important to mention here that only those who get selected for, and participate in, the Training camps of NPTC/NSTC are called Alumni of NPTC and NSTC.

The first get together of NPTC was organized at PIEAS during the first camp of NPTC 5 in the year 2000. Dr Abdullah Sadiq announced that the get together was to be an annual event. Since then it has been regularly organized annually prior to the first training camp of NPTC. In the year 2004, with the generous funding of HEC, the programme was expanded to all four basic science subjects i.e. Biology, Chemistry, Mathematics and Physics. The 6th Annual Get together took place at GIK-I in July, 2005, in which NPTC/NSTC Alumni representing all four NSTC subjects from all over Pakistan, and even some studying abroad, participated. Since then, annual nation-wide and regional gatherings have been arranged in which different issues are discussed to strengthen NSTC and STEM Careers Project. The alumni body now comprises of Doctors, Engineers, Chartered Accountants, Research Associates as well as alumni who are serving the country in Government and Private Organizations in well-reputed positions.

The alumni body after its initiation has been helping in various activities of the STEM Careers Project, like invigilation at the screening test, training camps of NSTC, preparing the Question bank and much more.

NSTC Alumni Association Magazine (NAAM) is another modest effort of the Alumni to promote the goals of NSTC and STEM Careers Project. This magazine is aimed at informing students about the NSTC application procedure, screening test, training camps, International Science Olympiads, Home Institutions and Coordinators, NSTC Alumni Association events, Alumni updates, interesting science articles, guidance for younger students to secure admission abroad and much more. There was a lot of enthusiasm when we launched the magazine and the alumni sent a huge number of articles which were interesting and informative. Their efforts are commendable, but it was decided that in this first issue only those articles should be included which carry information about NSTC and STEM Careers Project. The articles which were not included this time will be included in the next issues. The Editorial Board did a remarkable job in compiling these articles and the Editors, especially Mushal Noor, contributed a lot, despite the huge burden of her medical studies. The contributions of Fariyah Malik and Sehr Rasool in finalizing the first issue also deserve to be mentioned here.

Our Alumni, like Mehreen Alam, Eiraad Khalid, Palwasha Khan, Umair Sadiq, Marzieh Asad Ali, Bareera Hakim, the members of the editorial board and all other NSTC Alumni, whose names are not mentioned here, are now well-known in the society for their contributions towards science. NSTC Alumni Association is so popular now, that different organizations contact us for help and guidance, for which we are always available. However, we would also like to welcome more people to be our resource persons and join hands in our efforts to spread our message.

Along with the current sections in NAAM, two more sections will be added: 'Inbox', which will include suggestion, comments and any other mail to the Editors; and 'Alumni News', highlighting alumni activities, achievements and any distinguished news about Alumni which they share with us. We would like to welcome you to send us your comments, suggestions and articles for the next issues.

I, on behalf of alumni body, would like to take this opportunity to thank **Dr Ishfaq Ahmed**, Special Advisor to PM, **Dr Atta-Ur-Rehman**, Chairman HEC, **Mr Anwar Ali**, Chairman PAEC, **Dr S. Sohail. H. Naqvi**, Executive Director HEC, **Mr. Parvez Butt**, Secretary MoST and the former Chairman PAEC, **Dr Inam Ur Rehman**, Scientist Emeritus PIEAS, **Dr Muhammad Aslam**, Rector PIEAS, **Dr A D Raza Choudary**, DG SMS, Dr Khalid M Khan, Associate Professor, HEJ and Coordinator NCTC, Dr Nasim Irfan, Coordinator NPTC, Dr Sarwar Khan, Coordinator NBTC, Dr Ibrahim Qazi, Dr Akhtar Nawaz Malik, Coordinator NERC, Dr Javed Iqbal, Dr Abid Ahmed, Coordinator DBFC & Dr Junaid Mughal, for their continued help and support in the activates of NPTC, NSTC and STEM Careers Project. We hope that they will further extend their support and guidance for this national cause. The ever-motivating leadership of **Dr Abdullah Sadiq** is one of the main reasons behind the success of the Association and we hope that he may continue to guide us!

Over the last 12 years, NPTC, now NSTC and National Engineering Competition (NEC) have inspired the talented youth of the nation and every year more and more students look forward to participating in these events. Pakistan today, is facing the most serious challenges of her history and the only solution is to impart education to all and spread the message of science through projects like STEM Careers Project and organizations like NSTC Alumni Association. NPTC and now NSTC alumni has emerged as a community which I hope, will promote science, technical education and other goals of STEM Careers Project and hence bring education and prosperity to Pakistan, fulfilling the Quaid's dream. **Insha-Allah!**

*(Editor-in-Chief is currently the acting Project Director of the STEM Careers Project and the Chief Coordinator NSTC Alumni Association. He was a participant of first ever NPTC in 1997. He remained the Head Boy and General Secretary of the Forum (student union) of Islamabad College for Boys, G-6/3, Islamabad. He was awarded the President Rover Scout Award and became the youngest Assistant Leader Trainer of Asia of Boy Scouts Association. He is the founder of NPTC Alumni Association and since its initiation is heading it. His aim is to make NSTC Alumni Association a significant and productive organization of the Pakistan, with the help of its valuable peers of Alumni Association who were always there in the time of need)*





Mushal Noor  
Editor

## Why Research is Important for Pakistan

Many people imagine ‘research’ to be something beyond their reach, something which only the likes of Einstein, Newton, Mendeleev, Darwin or Watson can do. They believe that doing research requires a big brain, huge amounts of money and fearsomely complex machines. They reckon that their country and their careers can survive without research. And that is why, even amongst our educated and privileged, there isn’t much inclination towards research.

In order to dispel these myths, we need to demystify ‘research’ and the scientific process, and bring it down from its revered, sacred altar into our lives and professions. In many cases, to do research, all that is needed is an inquisitive and open mind, a vivid imagination, a good measure of common sense, and unfaltering perseverance. The use of complex instrumentation is not a necessary requirement for good research. Sometimes a paper and pencil is all that is needed. Admittedly, some research projects are of a nature which requires material resources and machines; but now, when nearly all countries and their institutes recognize the importance of research, funding, is not much of a problem for viable research projects.

To quote Einstein, “*The whole of science is nothing more than a refinement of everyday thinking.*” In a sense, most of us may be conducting some research in our daily life. When we want to buy a car, for example, we collect information about makes and models, analyze it, and then try to reach a ‘scientific’ conclusion on which car to buy. Human beings are gifted with the powers of reasoning and deduction, of innovation and invention, when they wish to use them. Clearly, research isn’t something so alien to our lives.

It is a common misconception that only ‘developed’ countries can afford to, and therefore should, set aside money for research. But research is not a luxury, to be conducted only by countries with the resources to spare. Without research aimed at identifying and solving problems, things will get no better. When India gained independence in 1947, the country faced the problem of allocating its scarce resources to its neediest areas. Jawaharlal Nehru, in this context, made the following statement: “*Because we are a poor country, we cannot afford not to do research.*”

Pakistan is what we call a ‘rapidly developing’ country. ‘Developed’ countries, like the United States, Germany, France and Japan can afford to spend money, resources and man-power on any sort of research they fancy. Their economy allows even such research to be funded which is not instantly or directly contributing to national development. However, Pakistan, with its limited available resources and less funding for R&D, has to carefully define its own needs and set its goals, and then do research accordingly.

Since the Partition, Pakistan’s economy has been slowly shifting from agriculture to industry. In 1947, agriculture accounted for about 53% of Pakistan’s GDP. Now, the service sector (telecommunications, transportation, advertising, and finance) accounts for more than 50% of the GDP. The top industries in Pakistan, which have helped fuel its economic growth, are telecommunications, software development,

automotives, textiles, cement and fertilizer, steel, ship-building, and more recently, aerospace. These are all industries that necessitate constant research and development to keep them at par with, and ahead of, competitors and the capriciously changing times.

Just to quote an example: the Second World War cost Japan millions of lives and left the country's industry, infrastructure and economy crippled. But now, Japan is the world's second largest economy (after the United States) and is one of the leading nations in the fields of scientific and medical research, technology and machinery. This astonishing revival is, in part, due to the Japanese government's policy of great investment and attention towards research and development: at present, Japan has the world's third largest budget for research and development, amounting \$130 billion USD; with over 677,000 researchers. We should take heed of their example, and that of other countries which have benefited from prioritizing R&D. Spending money judiciously in this quarter has done them no harm.

One of the important rewards of research addressing indigenous problems is self-sufficiency in energy, industry, agriculture, medicine and pharmaceuticals. Pakistan spends billions of dollars in revenue each year on its imports, including industrial and construction machinery, automobiles, computers, medicines and pharmaceuticals, civilian aircraft, defense equipment, iron and steel, electronics, and other consumer items. Basic research leading to applied research, along with proper investment, can help us become self-reliant in all these commodities instead of importing them at high cost to the country.

Traditionally, basic research (also called *fundamental* or *pure* research) is considered an activity that precedes applied research, which in turn may translate into practical applications. In other words, basic research provides the foundation for applied research. Its primary objective is the advancement of knowledge and the theoretical understanding of the relationships among variables. Basic science attempts to stimulate breakthroughs and breakthroughs often lead to an explosion of new technologies and applications. For example, basic research in Biology and Biotechnology facilitates Medical research, whereas basic research in Physics, Chemistry and Math forms the basis of applied research and development in Engineering, Computer Science, Industrial research, Weapons Development and Defence.

Therefore, not only is it essential for us to focus on basic as well as applied research, but we must also give due attention to science education. We need innovation and ideas, and people with the skills and commitment to translate and implement them. And for this, we need good students, good teachers, good researchers and good policy-makers. It is encouraging to see many talented Pakistani students going abroad each year in search of better education and research opportunities at the undergraduate and graduate level. But, it is worrisome that instead of bringing their talent and expertise back home, most of them are becoming a part of the ever-present and ever-increasing brain drain. Countries such as China and India have only a small percentage of their graduates living abroad and their economies can sustain such a comparatively small brain drain. But when the few people in Pakistan who have the inclination, experience and ability to do research decide to stay abroad, it is an irretrievable loss for science in Pakistan.

Nevertheless, we hope that many more talented individuals will turn their attention towards the needs of research and development in Pakistan, because we also, cannot afford not to do research. At the researcher's bench, not only are you satisfying your own curiosity and thirst for knowledge, but are also doing your part to understand the world, and to help make it a better place. To quote the Nobel Laureate Dr. Abdul Salam: "*Science and technology are a shared heritage of all mankind; East and West, South and North have all equally participated in their creation in the past, as, we hope, they will in the future.*"

*(The Editor, Mushal Noor is a student of Medicine at the King Edward Medical University, Lahore. She was among the top four students in NBTC-1. Mushal is currently working on a research project relating to Coronary Artery Disease. She intends to pursue a career in teaching and research in the biomedical sciences.)*



Amir Siddique  
Editor

## Promoting the Cause of NSTC

One of the main goals of NSTC alumni is to encourage student participation from around Pakistan in NSTC. We alumni believe that a vast majority of the youth, which has the potential to excel in such competitions, is unaware of or does not fully recognize the importance of this nation-wide activity. Therefore, we alumni go to various institutes in different parts of Pakistan to give presentations about NSTC and encourage the bright youth of F. Sc and A level first year to take part in this activity.

Let me illustrate my point with an example: Our first International Mathematical Olympiad (IMO) team (of which I was a member) did not perform well. Then, it was realized that more proficient students could be targeted for mathematics. To accomplish this, the National Mathematical Olympiad (NMO) was introduced. The number of participants in this event increased exponentially thanks to the efforts of the School of Mathematical Sciences (SMS), Lahore.

We believe that every student out there has potential and at least deserves the chance to compete to see what he or she can achieve. Who knows, the one student that could not take part in the competition might outstrip the rest, if given a chance? An uninformed or unwilling student, encouraged to take part in this activity, could be selected for the Pakistan team and win laurels for our country.

This exactly was the philosophy of us Lahore based NSTC alumni when last year, we set out to enlighten and encourage youth from Lahore Alma, Kinnaird College, LGS, LCWU, Beaconhouse and other institutes about NSTC. In turn, we saw a tremendous increase in the number of participants from these institutes. From Lahore Alma alone, the number of participants increased to 13 in NSTC-4 as compared to 2 in NSTC-3. Many alumni from cities such as Multan and Peshawar also gave similar presentations.

Although our aim was to present at as many institutes as possible, we were not able to go to as many institutes as we would have liked because of time constraints. This year we plan to expand our presentation campaign and cover most of the relevant institutes. Therefore, I would encourage the alumni from all other cities, particularly in Karachi and other areas of Sindh, Balochistan, NWFP and Punjab to join us in this noble cause. We hope that through our combined efforts, we will be able to spread the message of NSTC (read Science) in all corners of Pakistan.

All the best!

*(The Editor, Amir Siddique is currently a Junior at Lahore University of Management Sciences (LUMS), pursuing his BSc (Hons) in Mathematics. He was a member of first ever Pakistani team which participated in International Mathematical Olympiad, 2005)*