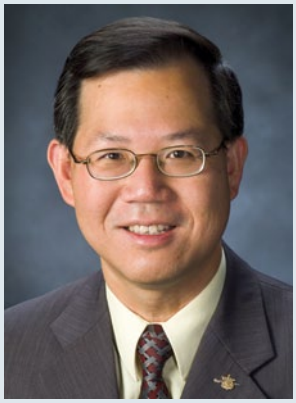
Interview with Alumnus Richard T. Lee



Richard T. Lee is the MLA for the riding of Burnaby North. Before being elected to the Legislature, Richard was a programmer analyst at TRIUMF, Canada's national particle research facility. In 1976 he earned a Combined Honours B.Sc. degree from UBC in physics and mathematics and in 1980 a M.Sc. (UBC) in Applied Mathematics.

Richard was first elected as the MLA in 2001 and was re-elected in May 2005 and 2009. He was appointed Parliamentary Secretary for Muticulturalism in March 2011.

Richard is a member of the new Cabinet Committee on Open Government and Engagement.

Previously, Richard served as Parliamentary Secretary for the Asia-Pacific Initiative (2005-2011), vice-chair of the Special Committee to Appoint a Merit Commissioner and Chair of the Government Caucus Asian Economic Development Committee.

He was also member of the Cabinet Committee on Climate Action and Clean Energy, the Legislative Select Standing Committee on Education, the Select Standing Committee on Legislative Initiatives, the Select Standing Committee on Public Accounts, the Select Standing Committee on Finance and Government Services, the Legislative Special Committee to Review the Police Complaint Process, the Special Committee to Appoint a Police Complaint Commissioner, the Government Caucus Committee on Economy and Government Operations and the Government Caucus Committee on Multiculturalism and Diversity.

Eric: Let's start near the beginning, what brought you to math at UBC?
Richard Lee: When I was a student, I attended half a year at Britannia Secondary School. Before that I was from Macau. During my high school years I became interested in math, especially trigonometry, geometry and some of the applications of calculus. We had a whole year of calculus in grade 12 in Macau. Math is a very fascinating area. I was just inside a world of the beauty of mathematics during my high school years. Math in high school led me to take further action and to enrol in math at University.

Eric: Did you ever have a favourite course or topic in math at UBC?
Richard Lee: Of course calculus, first year calculus because I had a strong background there already, and did quite well. That's the only course in which I got over 100%. Also, I believe calculus is fundamental to everybody in math and science, and I have always believed that.

There was a saying, "Math is the Queen of science and physics is the King of science," so at the time I wanted to master those two areas. That was my ambition, to apply mathematics. Even in my high school years sometimes I would sit down by myself and just do the exercises. I would do all the questions, not for homework, but just because I wanted to understand something. It was to get away from the world around me, to the world you go into, and then enjoy the closeness of the system. You have the axioms, and then you could derive the whole thing in order. Just using logic to derive a multitude of conclusions, which is fantastic, is something I really like.

Eric: What in particular made you decide to go into applied mathematics for your master's degree?
Richard Lee: I always think of math as a way to understand the physical world, and to use math as a tool to gain a better understanding of the world around us. Physics is describing the world, and math is a way to understand the physics principles. By chance I was taking the ordinary differential equations course in my second year at University. The professor was very good, Dr. Frederick Wan. I asked a lot of questions in class, and got a lot of answers as well. That summer I was offered a job under the summer job program, so I worked helping professor Wan develop models, and carried out calculations on economic development in the city and its relationship with transportation systems based on the Robert Solow model. We modeled how to optimize transportation and economic development in the city. With no roads no one can come in, so there is no economic development, and if you use all the urban land for roads then no one can live in the city. Of course there are some assumptions, a lot of assumptions in this model. I wrote computer programs using numerical methods to solve some equations. Every summer then since second year, I worked for a professor in the math department, helping them to do calculations. My interest continued after I graduated with my bachelor degree, so I entered a master's degree program in applied math.

I also took numerical analysis in computer science. I took a computer language course in my first year of university. At that time it was just the beginning of computer science.

The first computer program that I did was four lines, a Basic language program. The high school teacher found us a computer, and I remember that there were only two computers in all the high schools in the Province of British Columbia. One was in Point Grey, so we went over there, and punched the cards which were input into a card-reader to produce a paper tape. Then you run the paper tape into a machine and get output, e.g. just one line printing your name. This was my first encounter with programming.

Eric: What led you to work in particle physics?
Richard Lee: Well it's a long story. My interest in TRIUMF, the meson facility on the UBC campus, started from a teacher, and a field trip in grade 12. It was our physics teacher at Britannia Secondary, in 1972, and it was the physics class field trip. At that time, they had just started building TRIUMF. I saw the control room taking shape. There were a lot of people working on the site, doing construction, and also people playing table tennis. I thought to myself, "If in an organization people at their leisure can play some kind of sports, it must be a good place to work." In my first year of physics, they were building this machine and using some students to take out those plates, the iron plates, in order to trim the magnetic field of the machine. It was the shimming and trimming program. They needed a few first year physics students to help, and I became one of the students getting the opportunity to get into the heart of the structure and getting even more interested, "This is a big machine, it can do a lot of things. It would be fascinating to work in TRIUMF." So when I was close to finishing my master's thesis, I looked in the newspaper and they were looking for someone to be a programmer in the area that I wanted to go into. I was accepted to the position in the summer of 1979. It was my first full-time job out of university, and lasted until 2001. Over 22 years at TRIUMF, first as a programmer, then as a programmer analyst, doing calculations in areas around TRIUMF. For example solving the Maxwell equations in numerical magnetic field and electric field; supporting the beam dynamic group and the computing services group, and also seeing how different devices put into the cyclotron affect the magnetic field; studying how the beam of H-ions moves inside the cyclotron and predicting its behaviour. It's a group of particles traveling around the machine. When an H-ion hits a target, two of its electrons get stripped out and it becomes an H+ion (proton) going outside of the machine, traveling through the beam lines. I also helped scientists at TRIUMF by developing programs to help them get the data, analyse the data and interpret it graphically. At that time I also reverse-engineered some of the UBC computing graphics packages to adapt to the TRIUMF computing environment. For example I still remember analyzing a database on fonts and writing programs and subroutines to create and modify fonts. So, it was a way for me to learn about computing science, to learn about math, and to use math and numerical analysis to serve the scientific community.

Eric: What influenced your decision to go into politics?
Richard Lee: At that time I was participating in quite a few organizations in my community. I had moved to Burnaby in 1986 after I got married. Locally I started participating in the parent groups, the Burnaby Multicultural Society, the Civic Education Society, the Heritage Language Associations and eventually I was sitting in over 10 nonprofit organizations as a member of the board to serve the community. I became more interested in community service, and so eventually people asked me to run so I could spend 100% of my time for the community. Under some consideration, in 1993 I joined the local political organization of Burnaby North. I then was nominated, and ran in 1996 for the first time. I didn't get elected but it was close, I lost by about 750 votes. In 2001 I ran again and was elected, so this is my 10th year of service. I enjoy this opportunity, and I am honored to serve the community. It's a way to listen to what people want, and also to engage in the policy making process to make people's lives better. We are in a democratic society, and in some countries people are actually fighting to get a system like ours. So, when we have the chance of participating in this democratic process, we should. Not too many people are that interested in running for political office, but I think someone has to do it, so that's what I did.

Eric: How does mathematics play a role in the decisions you make?
Richard Lee: Of course statistics has a lot of application in politics. Even in a survey of popular opinions they need to design the questions in a way that really reflects true feelings. Of course for our voting systems, some mathematicians actually study some possible processes, e.g. the preferential ballot, those kinds of systems have mathematical models. Logic has a lot to play in decision making, and a lot to play in policy, what kind of policy, and the consequence of a policy. In a way, political parties depend a lot on axioms. They are built on certain beliefs, and from that we derive different actions or policies. Some political party has a particular axiom, say free enterprise should be defended. So free enterprise is the axiom, and the goal is to encourage investment and encourage people to succeed individually. Another party has another system, a different axiom, say equality. Based on that you derive policy to maximize the probability of equality. Then if you have more money we tax you much more. There are systems in between, and across the political spectrum.

Eric: In what ways does politics impact science?
Richard Lee: Of course funding is obvious. We have to make sure that research and development receive proper attention in the political system. It's important to demonstrate that it really is an economic generator. We need to get more people with advanced education and high skill training. More research and development, and more innovation to do things. The society has some obligation in general to develop human resources, to help the citizens, and to further their education and careers, making the society better in general. I think research and devel-

opment should have higher priority in all governments. If we don't have some niche in the world market, we will be falling behind. We have to increase our productivity to maintain our living standard. How to make society better, I think that's the ultimate goal.

Eric: In what ways do you see that government is trying to improve science in either education or research?
Richard Lee: By supporting innovation, supporting clean energy industries, and supporting research and development. I think we have so many areas in BC locally. For example we have the clean energy sector and the high-tech sector, where we certainly have a lot of research companies. In Burnaby we have a lot of people doing research and development, and even manufacturing to some degree on clean energy devices. Of course as I said, it is never enough in terms of government support for science and research. The policy of getting more universities in BC over the last few years has encouraged more people to go into post-secondary studies. I think some research shows that over 75% of future jobs will really depend on post-secondary education. The government recognizes that, which is why over the last 4 years they have tried to provide more resources for students, so that they have a better opportunity to go into university and get an education. I think that's an improvement over the years. Sometimes we forget that 10 years ago the number of seats in universities had a negative effect on some of the students trying to get an education.

Eric: What would you say is one of the most important things you learned throughout your career?
Richard Lee: The most important thing I learned is to follow your passions. Go into something you like, something you enjoy. Even in high school when you do work, mathematical work, you can go into your own world, a perfect world, where you can deduce things orderly, and enjoy it. Follow your interests, and then the career will follow. The world contains a lot of opportunities, and as long as you follow your passion, you can create a career out of that.

One career is probably not for life. That is why an education prepares you for a lot of areas, and can open up a lot of opportunities. I think that life is a process, you set different goals and at a certain stage you find something particularly important to you. This is your axiom, from that you derive your actions around you.

Eric: Do you have any regrets?
Richard Lee: No, except I would've liked to do more graduate studies. Sometimes you get sidetracked into other interests, and follow some passion.

Eric: What do you feel is your greatest accomplishment?
Richard Lee: The greatest? I think it is the ability to work under not so favourable conditions, and still keep your belief and working towards your goal. Don't give up if there are certain setbacks in life, that could be just another foundation for building up some later achievements. Life is never perfect.

Eric: Are there any individuals you would identify as having a significant impact on your life?

Richard Lee: I think, my teachers. The Choi Ko Middle school teachers in Macau, and in UBC Professors Frederic Wan, George Bluman, Colin Clark and Jim Varah all played some major roles in showing me that math is really interesting and has many applications in the real world. Of course in another dimension my family is also important in my life.

Eric: If you could give an undergraduate one piece of advice what would it be?
Richard Lee: Don't just do the homework. Go into some area where you are interested. Find something that interests you, something that you can actually master. Four years of university for an undergraduate is a very short time. Follow what you want to do, and the world of the future will probably utilize some of your studies, but prepare yourself for more. There are many jobs that people won't realize will be available in the future, and you may be working in an area that you never dreamt of working in. ■


Eric Naslund

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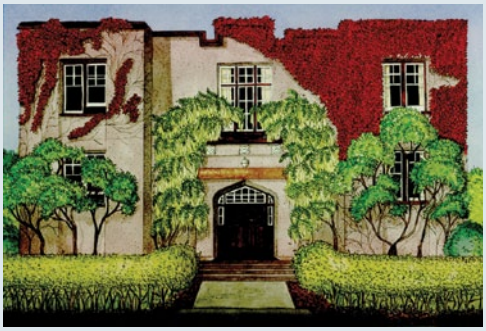

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