SIMON FRA
SPRING

Engineer, phy

An honorary Doctor of Science c
Social Sciences ceremony on We
convocation address.

Mr. Chancellor, Mr. President, n
honoured guests, graduands, fam
to be with you today. Two years
galaxy of stars. Today I wear a c

In May 2009, two crewmates and
an ascending pillar of flame and
spacecraft remains one of the mo
from the International Space Stat
fireball. Descent through the lov
Niagara Falls in a barrel.

At the end of a nominal mission,
steppes of Kazakhstan. But in an
Following a water landing, the cr
ocean for up to two days.

One of my most grueling days as
training in the Black Sea of the U
crew had just performed an emer
ocean. We were to take off our s
clothing and a water-tight rubber
protect us against the frigid wate
jump out into the Black Sea and

I must mention that three men in a Soyuz capsule is like three men in a telephone booth. It is impossible for the crew to do much of anything all at once. For our exercise, one crew member laid across the laps of the other two while we worked together to remove the spacesuit and put on the survival gear.

The secret to success is to complete the training is to do this before our core body temperatures rise too high. Working at an optimal pace is critical. If we work too fast, our core body temperatures will increase due to an elevated metabolic rate. If we work too slowly, we will also overheat under the multiple layers of thermal garments that we wear and in the stifling cabin atmosphere.

We failed the training exercise. As our body temperatures rose from 36 degrees Celsius to 39 degrees, we became drenched in sweat, and our spirit and efficiency fell. After two draining hours of struggling to get into our survival gear, not even one of us was completely suited. Our core body temperatures were high and rising. The medical doctors who were monitoring the exercise became alarmed and aborted the run. The three of us exited the capsule, exhausted and demoralized. If this had been our actual landing day, my crewmates and I would have died from hyperthermia inside the capsule or from hypothermia in the ocean.

Why have I told you a gloomy story of failure on this your day of convocation, aday when we are all gathered to celebrate and recognize success? I told you this story to share the fact that the trajectory to academic, professional and personal success is not straight and smooth.

Space exploration is no-kidding difficult. The harsh environment can be unforgiving. Astronauts are consequently expected to live and work at the extremes of our capabilities. As students you also overcame obstacles in your pursuit of university degrees. We must both face our unique impediments with determination.

My crewmates and I were determined to successfully complete the Black Sea water survival training, and that's why we pushed ourselves to do it again. We reviewed each step of the procedure, we adjusted our work pace, and were ultimately and joyfully successful during a second attempt.

In spite of its challenges, I can't imagine any career so fulfilling and downright fun as being an astronaut. Astronautics is synonymous with exploration. One great thing about my job is the repeated opportunities to explore inwardly as well as outwardly, to discover the limits of my personal capabilities, as well as the frontiers of the external world.

In the Black Sea, I didn't just explore the limits of my physical capabilities, but the limits of my mental and emotional ones as well. I discovered, for instance, that my energy, cognitive abilities and willpower shut down when my core body temperature reaches 39 degrees.

A couple years later during my International Space Station expedition, I discovered that living in an isolated, confined environment for six months makes me homesick for my family and Earth. I discovered that maneuvering multi-billion dollar spacecraft safely and precisely with Canada's robotic arm requires supreme mental concentration. I discovered that relating well with five

people of different nationalities, cultures, beliefs and native languages requires the utmost in psychosocial skills.

Some of the skills required of an astronaut come harder to me than others. Learning foreign languages is my Achilles heel. While I may not be the most linguistically gifted person in the world, I bet I am one of the most persistent. What I may lack in natural ability, I make up with determination to reach what may seem impossible.

If I have been successful in my career, it is because I have had these repeated opportunities to function at the limits of my personal capabilities. It is when I function outside of my comfort zone that my performance is highest and my achievements are most meaningful.

Exploration is a basic instinct of humans, whether it be inwardly or outwardly directed. Outward exploration of our physical world is about breaking through barriers—barriers of height, of depth, of location, of capability, of knowledge.

People sit up and take notice when someone climbs Mount Everest for the first time, or when someone dives the depths of the ocean to discover the wreck of the Titanic, or when someone leaves Earth orbit and ventures into the solar system.

I'm proud to have represented Canada in outer space. While space exploration has provided many pragmatic benefits, one of its greatest symbolic benefits is that it bolsters our national spirit of exploration. It inspires us to contemplate the unknown and to attempt the difficult.

Today when we speak of outward exploration, we no longer refer solely to geographical frontiers. Most of the regions of the world have now been charted. Rather, the new frontiers of exploration are in the Arts, Sciences, Technology, Medicine and Management. There is much left to discover: the basis of disease, the riddle of consciousness, the nature of dark matter, the meaning of humanity. Some contemporary explorers wear parkas. Other explorers wear lab coats, pressure suits, scuba gear and business suits. Still others carry video cameras or a paint