



**GEOMATICS**  
ENGINEERING



**UNIVERSITY OF  
CALGARY**

# Message from the Head



On June 22, the University of Calgary announced that the Faculty of Engineering will receive \$25 million from Mr. Seymour Schulich which will be matched by another \$25 million from the Province of Alberta. This \$50 million donation will be used to build on the

successes of the Faculty of Engineering, with a specific focus on supporting undergraduate students.

Over 100 new scholarships will be established, with values of up to \$10,000 per year for Calgary-based students, and \$20,000 per year for students from outside of Calgary. Additional funds will be used to support student activities including field trips and clubs. In

recognition of this generous donation, the Faculty of Engineering has been renamed the Schulich School of Engineering.

This has given a great boost to our Faculty, and this will further enhance our program through the attraction of bright students who will be greatly supported throughout their studies.

Elizabeth Cannon  
Professor and Head

# Farewell Marguerite

The Department of Geomatics Engineering would like to send best wishes and a heartfelt thank you to Marguerite Anderson for her tremendous contributions to our department over the years. Marguerite officially left the department on June 30, 2005. This was a difficult decision for her since she has been with the Geomatics department since 1989. Marguerite felt that based on her family situation, it would be best for her to

move with her mother closer to her home community and other family members.

We will greatly miss Marguerite since she has had such an impact on us as individuals, and our program. On June 29th we celebrated with coffee and cake while formally acknowledging her contributions. Friends from the department and around the university campus attended to bid her farewell.

Geomatics is pleased to announce that Ms. Marcia Inch has been appointed as the Department's new Administrative Assistant, effective June 20. Many of you know Marcia since she has had a long association with the Department. We are glad that she is back with us and we are confident that she will provide excellent leadership to our program.

### Inside this issue:

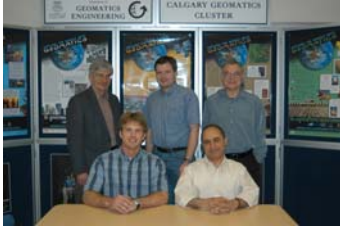
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(L to R) Dr. Ed Krakiwsky, Ms. Marguerite Anderson, Dr. Klaus-Peter Schwarz.

# Congratulations

• Congratulations to the following students who defended their theses: Liman Mao, MSc; Salman Syed, MSc; Wojciech Kubacki, MEng; Girija Dharmaraj, MSc; Andrew Huang, MEng; Santosh Phalke, MSc; Valarmathy Meenakshisundaram, MSc; David McAllister, MSc; Rob Watson, MSc; Diep Dao, MSc; Kongzhe Chen, PhD; Bijoy Paul, MSc; Todd Richert MSc.



*Todd Richert successfully defended his MSc thesis*

• Several faculty members (and one Emeritus Professor) received awards June 09, 2005 at the Engineering Faculty Council: Kyle O'Keefe-Geomatics Engineering Teaching Excellence Award; Naser El-Sheimy-Geomatics Engineering Research Excellence Award and the Faculty of Engineering Research Excellence Award; Susan Skone-Faculty of Engineering Service Award; Gerard Lachapelle-Faculty of Engineering Graduate Education Award; Klaus-Peter Schwarz-Faculty of Engineering Lifetime Achievement Award.

• Raymond Tsoi won the Shell Canada Outstanding Student Poster Paper Award at the Annual Meeting of the Canadian Geophysical Union, for his poster entitled "GPS Based Navigation for Future Geopotential Missions".

• Dr. Naser El-Sheimy has been awarded the Association of Professional Engineers, Geologists and Geophysicists (APEGGA) Excellence in Education award for exemplary contributions to teaching and learning. .

• Dr. Yang Gao has been appointed LuoJia Chair Professor of Wuhan University, China. The appointment will further strengthen the academic collaboration between Wuhan University and University of Calgary in the field of geomatics.



*Salman Syed successfully defended his MSc thesis*

# Student News

• Engineering Design Open House was on April 12, 2005. and showcased senior design project displays from capstone courses in Civil, Computer, Electrical, Geomatics, Manufacturing, Mechanical, Petroleum, Software Engineering and also showcased first year design projects and drawings.

• The Second Annual Faculty of Engineering Graduate Student Research Conference was held on May 2 & 3. This year 129 graduate students in the Faculty of Engineering gave a brief presentation of their on-going research. Geomatics

award winners are: Rita Cheng, Matthias Weigelt, and Bo Zheng.

• Professor Gérard Lachapelle, Professor Elizabeth Cannon, Adjunct Professor Richard Klukas, and Messrs. Sanjeet Singh and Rob Watson have been selected as this year's recipient of the Canadian Aeronautics and Space Institute Casey Baldwin Award for their paper entitled "Hardware Simulator Models and Methodologies for Indoor Performance Assessment of High Sensitivity Receivers". This paper was done in collaboration with Spirent

Communications (SW) Limited, U.K. The paper was co-authored by Spirent personnel Messrs. Peter Boulton, Arnie Read and Ken Jones.

• Winners for the best ENGO 500 project this year are Dr. Habib's group: John Rasmussen, Mike Wollersheim and Diana Yang.

• Mike Wollersheim received the APEGGA Education Foundation Gold Medal in Geomatics Engineering for achieving the highest proficiency in our program.

# Visitors

• Professor Jiancheng Li, from Wuhan University was here from June 10-30. He was awarded a Distinguished International Research Fellowship by the Faculty of Engineering at the University of Calgary. This was an opportunity for him to establish links and/or joint research with our faculty members in Geomatics Engineering.

• Professor Dieter Fritsch, Rector/President of Stuttgart University, along with Dr. David Philips, Director of International Affairs, made an official visit to the University of Calgary May 11 & 12. Professor Fritsch is a specialist in Geodesy and particularly in Photogrammetry and made a special presentation of his research to the

Department of Geomatics Engineering. Both our institutions have over 25 years of cooperation in student and faculty exchanges. Stuttgart University is interested in pursuing ways of maintaining that exchange in the future, including participation of our students in their summer and winter university programs.

# Research Spotlights

## Automatic Aircraft Landing at Sea

Imagine flying at 240 km/h to a landing target only 45 m long, on a runway only 150 m long. Now add the complication that the target is constantly tilting and moving. This is the scenario US military pilots face every time they land on an aircraft carrier. As amazing as this may sound, the next goal is to be able to do it automatically. Sound impossible? Well it's not entirely.



*Flying at 240 km/h to a landing target only 45 m long, on a runway only 150 m long.*

The Position, Location And Navigation (PLAN) group has been working with ARINC Engineering Services Inc. on the US Navy's sea-based Joint Precision Approach and Landing System (JPALS) designed to accomplish the above task. By using GPS to accurately compute the relative position of the ship and aircraft carrier, the aircraft is able to be controlled automatically to compensate for ship motion right up until touchdown. However, in order for the system to work reliably, all possible error sources must be properly accounted for. To this end, the PLAN group has most recently been focusing on two aspects of the project.

The first is assessing the deformation of the aircraft carrier superstructure as a function of ship dynamics, using several GPS and INS systems mounted around the ship. Methods for predicting (and thus compensating) for these deformations are also being developed. Second, work is being done to determine how reliably the carrier phase ambiguities can be resolved; a difficult requirement critical for meeting the stringent accuracy specifications.

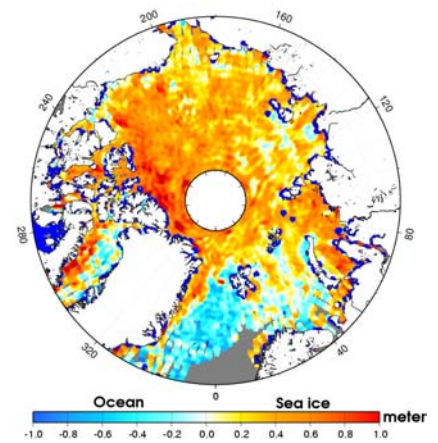
The University of Calgary personnel working on this project are Professors M.E. Cannon, G. Lachapelle, K. O'Keefe and Dr. M. Petovello.

## Is Arctic Sea Ice Thinning?

To answer this question, Dr. Alexander Braun works with ESA, NASA, the Ohio State University and the Danish Space Center on sea ice thickness determination from space.

The public is well aware of some of the consequences of climate change, e.g. global warming, rising sea level, desertification and flooding. A rather new topic which is considered a strong indicator in response to climate change is sea ice. Recent studies based on passive microwave data (SSM/I) and scatterometry indicate that sea ice is thinning rapidly in the Arctic ocean. However, these observations discuss sea ice extent and concentration only, but cannot directly determine the sea ice thickness, which is the controlling factor for sea ice dynamics and ocean-atmosphere heat transfer. The NASA laser altimetry

mission ICESat completes our observations by providing sea ice freeboard height (ice above sea level) which is used to derive sea ice thickness. Through science team access to the latest ICESat data, Dr. Braun has estimated the first Arctic-wide maps of sea ice freeboard height. It shows temporal variations of the sea ice height in the Arctic. Such maps find applications in ship navigation and safety, climate change assessment, or ocean circulation modelling. Through the participation in the European Space Agency (ESA) project ARCGICE, these observations will also improve our understanding of the Arctic gravity field in combination with data from the dedicated gravity field mission GRACE.



*Sea ice freeboard height derived from ICESat data in March 2003*

## Alumni Voice

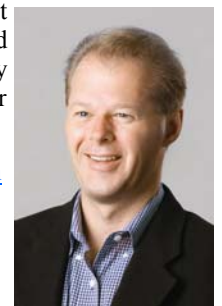
Its been an incredible 18 years since I graduated from Geomatics (Surveying) Engineering. My journey along the way has been filled with tremendous experiences ranging from working on the infamous "Big Dig" project in Boston with the BCS Group, to co-founding a GPS applications company called Keplerian Positioning Systems (KPS) Ltd in the early 90's, to my involvement in the Location-Based Services (LBS) industry with Cell-Loc Inc. as a business development executive, and finally, to my current geomatics venture, pioneering a

new genre in the growing mobile entertainment industry called location-based entertainment.

In 2003, I founded KnowledgeWhere Corp. [www.knowledgewhere.ca](http://www.knowledgewhere.ca) to exploit my vision of creating mobile video games using GPS technology embedded in mobile devices. Over the past two years I have assembled a team of talented and hard working individuals (geomatics engineers among them) to create, design and build innovative and award winning location-based entertainment products that we

market to the mobile operators around the world under a wholly-owned entertainment branding and publishing company called Blister Entertainment Inc.

[www.blisterent.com](http://www.blisterent.com)



*James (Jim) R. George, P.Eng., BSc 1987*



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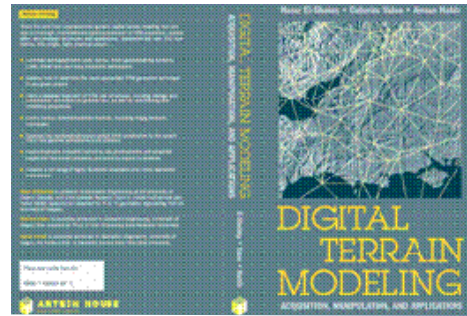
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*A Passion for Excellence*

**We're on the web:**  
[geomatics.ucalgary.ca](http://geomatics.ucalgary.ca)

## "Digital Terrain Modeling: Acquisition, Manipulation, and Applications"

By Drs. Naser El-Sheimy, Caterina Valeo, and Ayman Habib. Published by Artech House, this book is the product of several years of effort devoted to educating Geomatics Engineering students in Digital Terrain Modeling at the University of Calgary. Dr. Naser El-Sheimy began developing course notes which gradually evolved into this book, with the assistance of Drs Valeo and Habib. The work fills a very large gap in the literature on digital terrain models (DTMs) and covers all the essential elements with applications in environmental modeling and mapping in a mathematically rigorous, highly advanced, thoroughly complete, and cohesive manner. This book is intended for a wide variety of users both within and external to the geomatics community and is now available for purchase through [www.artech-house.com](http://www.artech-house.com).



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## Department Activities

- Annual Canadian Geoid Workshop was held May 11, 2005.
- Strategy meeting was held on June 06, 2005.
- Block graduate courses: "Advanced GIS Receiver Technologies," taught by Dr. J. Ray; and "Digital Signal Processing (DSP) with Applications to Geomatics Engineering," taught by Dr. A. Noureldin.
- Tutorial "Geo-Referencing, LiDAR, Imaging Systems, and InSAR: Principles and Applications" given on June 07, instructed by Drs. N. El-Sheimy, A. Habib, and B. Mercer.
- Campus Fair was held on Saturday June 18. This annual campus wide event showcases all of the different disciplines on campus. The target audience is the general public with a specific focus on families with elementary school age children. Our nine department volunteers introduced



*Robotic Total Station (Campus Fair)*

approximately 300 people to Geomatics Engineering. Our display included stereo photo viewing, a 3-D poster of Calgary, a robotic total station, a Geomatics Engineering poster display, and "Build your own surveying instrument".

- Dr. Naser El-Sheimy was promoted to Full Professor effective July 01, 2005
- Dr. Nico Sneeuw was promoted to Associate Professor effective July 1, 2005.
- Welcome Dr. Danielle Marceau who will join the Department July 1, 2005. Dr. Marceau's area of teaching/research is GIS.
- Dr. Mike Sideris, Associate Dean, will take a one year sabbatical leave, effective August 1, 2005.

## Coming Events

- ENGO 501: Field Survey Camp, August 22—September 01, 2005
- Fall Graduate Courses: Navstar GPS: Theory and Applications; Advanced Topics in Digital Image Processing; LIS; Advanced Estimation Methods and Analysis.

### Sites to Visit:

- <http://www.alsa.ab.ca/>
- <http://www.cgu-ugc.ca/>
- <http://www.apegga.com/>
- <http://www.positioningtechnology.co.uk>