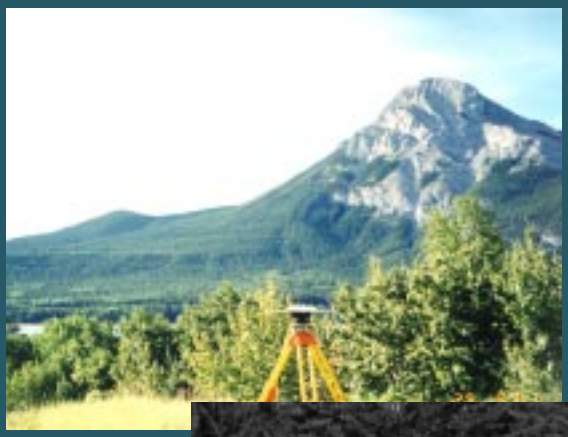
DEPARTMENT OF GEOMATICS ENGINEERING



PROGRESS REPORT 2001/02

UCGE
Number 50033

UNIVERSITY OF CALGARY

GEOMATICS ENGINEERING

PROGRESS REPORT
2001/02

DEPARTMENT OF
GEOMATICS ENGINEERING

Faculty of Engineering

May 2002

UNIVERSITY OF CALGARY
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Calgary, Alberta
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***Cover Photo**: Various scenes from Survey Camp, 2001(top two pictures) and Directional Antenna Pointing at MacEwan Student Centre for Indoor Location Tests (bottom picture)*

Admitted to the Degree of
BACHELOR OF SCIENCE

William John Akehurst (Internship)
Maria-Magdolna Barabas (Internship)
Jessica Dyann Barich (Internship)
Jesse Paul Carels
Michelle Shuk Kwan Chan
Samantha Ngan Fa Chin (Internship)
Scott Alan Crawford
(With Distinction) (Internship)
Alonzo Eduardo de la Cruz
Lesley Leanne Ewoniak (With Distinction)
Anjanette Marie Gordon (Internship)
Matthew Adam Holloway (Internship)
Andrew Kuo An Huang (Internship)
David Allen Knight
Christopher Daniel Kuntz
Randolph Lee (Internship)
Michelle Lynn Martin (With Distinction)
(Internship)
Lynn To Linh On
Robert Andrew Pinkerton
Kerri Lynn Robinson (With Distinction)
(Internship)
Shiva Shenoy
Agata Kamila Siodlok
Nikhil Sonpal (Internship)
Cary Andrew Suderman
Landra Karolyi Trevis
Mark David Woychuk
Trevor Mark Dempsey
Jeffrey Allan Fehr
Kevin Darryl Grover (Internship)
Victoria Anne Hoyle
Hua Huang (Internship)
Wojciech Kubacki
Cynthia Yee Ki Kwong
Craig Andrew Marshall (Internship)
Troy Carson Motz (Internship)
Munir Odhwani
Courtenay Michelle Parkinson (Internship)
Todd Allan Richert (With Distinction)
Gregory James Roesler (Internship)
Jayanti Jessica Sharma (With Distinction)
(Internship)
Javier Chun Ning Siu
Sean Michael Studer
Mark Peter Theuerkauf
Steven James Van Berkel (With Distinction)

Admitted to the Degree of
MASTER OF ENGINEERING

Robert Martin

Admitted to the Degree of
MASTER OF SCIENCE

Fadi Bayoud
Chuanyun Fei
Khaleel Khan
Mark Merner
Georgios Vergos
Cameron Ellum
Andrew Jakab
George Liu
Eun Hwan Shin
Donnalouise Watts

Admitted to the Degree of
DOCTOR OF PHILOSOPHY

Luis-Paulo Fortes

TABLE OF CONTENTS

HIGHLIGHTS 2001/2002

This Report covers the period May 2001 to April 2002.

In Fall 2001 1 student convocated with a BSc and in Spring 2002, 42 students received their BSc degree, one student their PhD and ten students their MSc degree and one student their MEng. Undergraduate enrolment reached between 51, 48 and 51 in each year, in addition to 20 students entered in the Internship Program. Demand for our BSc, MSc and PhD graduands remained exceptionally strong.

The 2001-2002 fiscal period was another very successful year from a research excellence point of view. Faculty members have continued to secure major research funding. The average research funding per faculty member reached $238,000 for the reporting period. Two multi-disciplinary, multi-university teams led by **Dr. M. Sideris** and **Dr. N. El-Sheimy** were awarded a total of $1,091,000 by the GEOIDE Network Centres of Excellence for a three year project. A four-year NSERC Strategic grant of $460,000 was awarded to a team of faculty members, with **Dr. N. El-Sheimy** as Principal Investigator. **Dr. C. Valeo** was awarded an Establishment Grant from the Alberta Ingenuity Fund in the amount of $243,275. **Dr. M.E. Cannon** received a prestigious NSERC Steacie Fellowship which is awarded to the most outstanding Canadian university scientists or engineers who have earned their doctorate in the last twelve years. This is the first time in the history of the Faculty of Engineering that one of its faculty members received this fellowship.

Highlights 2001/2002

- Four new faculty members
- Recruitment in process for four more faculty members
- Research funding reaches $238,000 per faculty member
- Numerous senior faculty and student awards
- Involvement in high level national and international boards, professional & learned societies
- Record number of convocants

Dr. Elizabeth Cannon being congratulated by Dr. Penina Axelrad on receiving the Johannes Kepler Award of the Institute of Navigation in Salt Lake city, September 14, 2001.

Numerous other awards were received by students and faculty members which are detailed on the following pages. Several faculty members continued to serve in leadership positions on various boards and in learned societies.

Drs. Nico Sneeuw, Richard Klukas, Matthew Tait and **Ms. Mele Rakai** joined the Department as faculty members during the period covered by this report. They are introduced later on in this report. **Drs. Mike Barry, Ayman Habib, Darka Mioc** and **Chris Kotsakis** will join the Department in early Fall 2002. Their areas of specialization are GIS/Land Tenure, Digital Photogrammetry, Geospatial Information Technology and Geodesy, respectively. Dr. K.P. Schwarz, a founding member of the Department, retired in December 2001. Dr. Vincent Tao resigned in October 2001. Dr. Brian Ballantyne completed his five year appointment as Assistant Professor (Western Canadian Land Surveyors Professorship in Cadastral Studies) in December 2001.

G. Lachapelle
Professor and Head

Dr. G. Lachapelle and graduate students during an ENGO 625 Navstar GPS: Theory and Applications lecture

AWARDS AND RECOGNITION

Sameh Nassar receives his PCI Geomatics Best Student Paper Award at the 3rd Annual General Meeting, Fredericton, NB, June 2001.

Three students won best paper awards:
***Paul Alves**, The Effect of Galileo on Carrier Phase Ambiguity Resolution,* Institute of Navigation GPS 2001, Salt Lake City, Utah.
***Kyle O'Keefe**, Availability and Reliability Advantages of GPS/GALILEO Integration,* Institute of Navigation GPS 2001, Salt Lake City, Utah.
Sameh Nassar, won the GEOIDE Network PCI Geomatics Student Best Paper Award for the paper *Bridging DGPS Outages in Kinematic Applications Using a Simple Algorithm for INS Bias Modeling.* The award was presented at the 3rd Annual General Meeting in Fredericton, NB.

Graduate student ***Michael Kern*** won the prize for the best oral paper presentation by a student during the IAG Scientific Assembly, Budapest Hungary. His paper, *A Comparison of Direct and Indirect Numerical Methods for the Downward Continuation of Airborne Gravity Data* was co-authored by his supervisor, Dr. Klaus-Peter Schwarz.

Dr. Susan Skone and her graduate students ***Mahmoud El-Gizawy*** and ***Sudhir Shrestha*** won a Best Paper Presentation Award for their paper entitled *An Ionspheric Warning and Alert System for the Canadian Coast Guard DGPS Service* at ION GPS2001 Conference. The paper was co-authored by Sam Ryan of the Canadian Coast Guard.

Graduate students ***Georgia Fotopoulos*** and ***Robert Radovanovic*** each received a Ralph Steinhauer Award of Distinction. This award was established in honour of Ralph Steinhauer the native-born Albertan who became one of Alberta's lieutenant-governors and a leader of the Province's Indian people. The award is to recognize the academic achievement of students studying in Alberta.

Dr. Elizabeth Cannon received the Johannes Kepler Award at the Institute of Navigation GPS2001 conference held in Salt Lake City, September 11 - 14. The coveted award, considered the most

prestigious in its field, is given annually for sustained and significant contributions to satellite-based navigation.

Dr. Naser El-Sheimy received the 2001/2002 Departmental Teaching Excellence Award as well as the Faculty of Engineering Teaching Excellence Award. ***Naser*** also received the 2002 Geomatics Engineering Department Professor of the Year (voted by the students) and the University of Calgary Students' Union Teaching Excellence Award for 2002.

Naser El-Sheimy (left) receives the Faculty of Engineering Teaching Excellence Award from Chan Wirasinghe, Dean of Engineering

Dr. Yang Gao received the 2001/2002 Departmental Research Excellence Award.

Dr. Susan Skone was awarded the International Association of Geodesy's 2001 Young Authors Award for her paper on *The Impact of Magnetic Storms on GPS Receiver Performance*, published in the Journal of Geodesy. This award is intended to draw attention to important contributions by scientists less than 35 years old and to foster excellence in scientific writing.

Dr. Elizabeth Cannon won a Spotlight Award presented by the Women in Film and Video Vancouver and the Wired Women Society. The awards recognize accomplishments in all aspects of the industry: creative, managerial, technological and educational.

Dr. Gérard Lachapelle won a Best Paper Award at the Satellite Navigation and Positioning World Show held in Nice, France, November 13-15, 2001, for his paper *Use of Multiple Reference Station Approach for Enhanced GNSS RTK Marine Positioning and Navigation*.

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Faculty Members at the Annual Strategic Meeting, Canada Olympic Park, May 2002. Back LtoR: Richard Klukas, Mele Rakai, Nico Sneeuw, Elizabeth Cannon, Michael Collins, Michael Sideris, Isabelle Couloigner
Seated: LtoR: Bill Teskey, Susan Skone, Naser El-Sheimy, Gerard Lachapelle, Matthew Tait , Caterina Valeo,
(MIssing from the photo: Yang Gao)

PERSONNEL

Faculty

Dr. G. Lachapelle
Professor and Head
CRC/iCORE Chair in Wireless Location
B.Sc., M.Sc., L.Ph., Dr. Techn. (Technical University of Graz), P.Eng., C.L.S., Satellite-based positioning and navigation, wireless location

Dr. M.J. Collins
Associate Professor and Associate Head (Undergrad)
Assistant Dean (Student Affairs)
B.Sc., M.Sc., Ph.D. (York), Microwave remote sensing, geometric and radiometric analysis of digital images, polar science.

Dr. S.H. Skone
Assistant Professor and Associate Head (Graduate Studies)
B.Sc., M.Sc., Ph.D. (University of Calgary), Wide-area differential GPS, , atmospheric effects and modelling on satellite navigation.

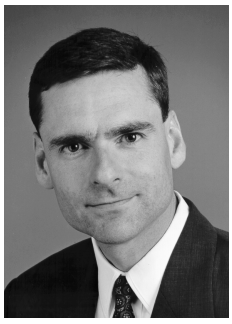
Dr. B.A. Ballantyne
Assistant Professor
Western Canadian Land Surveyors Professorship in Cadastral Studies
B.Sc. (Geography), B.Sc., M.A.Sc., Ph.D. (University of Otago), Boundary law, cadastral reform, environmental ethics, aboriginal title.

Dr. M.E. Cannon
Professor
Chair, Women in Science and Engineering (Prairie Region)
B.Sc. (Mathematics), B.Sc., M.Sc., Ph.D. (Killam Scholar, University of Calgary), P.Eng., C.L.S., NSERC Women's Faculty Award, Satellite-based radionavigation systems, precise static and real-time kinematic positioning.

Dr. I. Couloigner
Assistant Professor
Fr. Ing., PhD (trés honorable, Université Nice-Sophia Antipolis/École des Mines de Paris)
Digital image processing, data fusion and wavelet transformation, and high resolution remote sensing imagery.

Dr. N. El-Sheimy
Assistant Professor
B.Sc., M.Sc., Ph.D. (University of Calgary),
Multi-sensor systems, real-time mapping and their applications in (GIS).

Dr. Y. Gao
Associate Professor
B.Sc., M.Sc., Ph.D. (University of Calgary), P.Eng.
Robust estimation, satellite positioning and navigation, mobile information management.



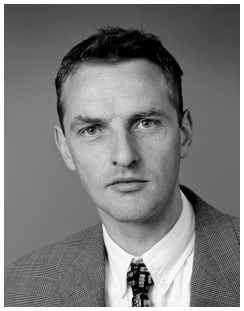
Dr. R.W. Klukas
Assistant Professor
B.Sc., M.Sc., Ph.D. (University of Calgary), P.Eng. Wireless communicaton and location, signal processing.

Ms. M.E. Rakai
Assistant Professor
R.Surv. M.Surv.S.c. (Melbourne) Land tenure, land information systems, cross-cultural land tenure systems.

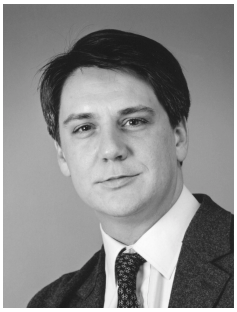
Dr. K.P. Schwarz
Professor
Dipl.Ing., M.Sc. Dr.-Ing. (Summa cum laude; Technical University of Berlin), P.Eng., Geodesy, inertial techniques, airborne gravimetry.

Dr. M.G. Sideris
Professor and Associate Head
Associate Dean (Research and International)
Dipl.Ing. (Honours); M.S.c, Ph.D. (The University of Calgary) Geodesy, optimization in geomatics, spectral analysis, gravity field approximation.

Dr. N.J. Sneeuw
Assistant Professor
ir, Dr.-Ing. (Technical University Munich) Geodesy, gravity field modelling, satellite geodesy, gravity field satellite missions



Dr. M.P. Tait
Assistant Professor
BEng (Hons), Ph.D. (Leeds) Industrial measurement systems and methodologies, closer integration of metrology, 3D modelling.



Dr. C. Tao
Assistant Professor
B.Sc., M.Sc., Ph.D. (University of Calgary), P.Eng.
Geospatial Information Systems.

Dr. W.F. Teskey
Professor and Associate Head
B.Sc. (Distinction; APEGGA Gold Medal), M.Sc., Dr.-Ing. (Stuttgart University), P.Eng., A.L.S., C.L.S. Precise engineering and deformation surveys, integrated anlysis of deformations.

Dr. C. Valeo
Assistant Professor
B.Sc., B.A.Sc., M.Eng., PhD (McMaster), P.Eng., Water resources and environmental engineering, remote sensing and GIS.

Staff Changes

Nico Sneeuw celebrating his birthday

Dr. Nico Sneeuw was appointed in a tenure-track geodesy position. Dr. Sneeuw has a diploma in Geodetic Engineering from the Delft University of Technology (Netherlands) in 1989. He spent 3 years as research assistant at the same university. In 1993 he joined the Institut für Astronomische und Physikalische Geodäsie, Technical University Munich (Germany), as a research associate. Dr. Sneeuw received a PhD in 2000 from the Technical University Munich on his work on global gravity field modelling from satellite observations. Since 1995 he has given lectures in potential theory, physical geodesy and satellite geodesy. Moreover he teaches an introductory course on Matlab. Over the past years Dr. Sneeuw has been actively involved in several international projects in connection with gravity field satellite missions (STEP, CHAMP, GRACE and particularly GOCE). In his new position, Dr. Sneeuw will continue his work on global gravity field modelling and satellite missions with special focus on the ESA mission GOCE. Emphasis will be put on the interdisciplinary character of gravity field research, linking geodesy to oceanography and solid-earth physics. Dr. Sneeuw began his duties on July 1, 2001.

Dr. Richard Klukas was appointed to a faculty position in the area of Wireless Location. Dr Klukas holds BSc and MSc degrees in Electrical Engineering from the University of Calgary. During the course of his Master's studies he became interested in the application of electrical engineering principles to positioning and navigation. As a result, he began studies in the Department of Geomatics Engineering at the University of Calgary and earned his PhD in Geomatics Engineering in 1998. In 1995 Dr. Klukas was one of a group of researchers who founded Cell-Loc Inc., a wireless location technology company located in Calgary, Alberta. The mandate of Cell-Loc was to develop a network-based positioning system for wireless transmitters such as cell phones. Dr. Klukas was responsible for the positioning algorithms for the system and holds patents for this technology. Much of his PhD work is still used in the Cell-Loc system. Following the completion of his PhD, Richard worked at Cell-Loc Inc. in a number of capacities. From March 2000 to March 2001, he lived in Dallas, Texas where he started Cell-Loc's U.S. office. He also has industrial experience with Nortel, Canada. Dr. Klukas' research interests include signal processing techniques specifically for positioning, RF propagation, and wireless positioning and navigation. He will be working closely with Dr. G. Lachapelle, the Canada Research Chair and iCORE Chair in Wireless Location. Dr. Klukas began his duties on September 1, 2001.

Dr. Matthew Tait was appointed to a tenure track position in Industrial Metrology in November 2001. Matthew has a BEng (Hons) degree in Civil Engineering from John Moore's University,

Liverpool, England. He became interested in industrial metrology during his intern year in railway engineering, where he applied such methods as laser guidance for track-laying machines, and close-range photogrammetry for tunnel profile measurement. He subsequently attended the University of Leeds, England, to undertake research in close-range photogrammetry for Civil Engineering, and received his PhD in 2000. Since 1997 he has worked extensively in mainland Europe as project manager and consultant for a Belgian engineering surveying company supplying the chemical process industry. His principle interest during this time was in the creation of as-built 3D CAD models from close-range photogrammetry, laser scanning and conventional methods. Dr. Tait's research interests include the fields of industrial measurement systems and methodologies, and the closer integration of metrology, 3D modelling, and spatial information systems, particularly for the chemical process industry. Dr. Tait began his duties on November 19, 2001.

Mele Rakai was appointed to a tenure track Land Information Systems/Land Tenure position in January 2002. Mele holds an MSurvSc degree from the University of Melbourne (1994), and a BSurveying degree from the University of Otago (1984). She is currently completing her PhD on comparative analysis and modeling of cross-cultural land tenure systems at the University of New Brunswick, where she had also been a research and teaching assistant. Mele is Fiji's first female licensed Surveyor and has worked in Fiji in both the private and government sectors, carrying out cadastral, topographical, engineering, geodetic and hydrographic surveys. She has worked as a Senior Technical Officer in the Fiji Land Information Systems (FLIS) Program, where she was responsibile for developing policies for Fiji's national LIS program. In 1996 she joined the University of the South Pacific in Suva, Fiji as a lecturer, before coming to Canada to commence her PhD in 1997. Mele has represented Fiji in various meetings and conferences hosted by the land tenure section of the UN's Food and Agriculture Organization (FAO) and by Commissions 3 and 7 of the International Federation of Surveyors (FIG). She has also been an invited speaker on Aboriginal tenure and land information systems at various conferenes in New Zealand, Australia and the United States. Her research interests include land tenure, aboriginal rights, land and geographic information systems, land information management, land administration and more recently, legal pluralism and women's issues in land studies. Ms. Rakai began her duties on January 1, 2002.

Dr. Lachapelle with the new faculty members. Back L to R: Nico Sneeuw, Gerard Lachapelle, Mele Rakai, Richard Klukas. Sitting L to R: Isabelle Couloigner, Matthew Tait

Dr. Vincent Tao resigned his position at the University of Calgary to take up a CRC Chair at York University.

Vincent Tao's farewell party

Dr. Brian Ballantyne completed his five year appointment as Assistant Professor (Western Canadian Land Surveyors Professorship in Cadastral Studies).

Ms. Marcia Inch completed her five year term as Assistant to the Chair, Women in Science and Engineering and took up a new position in the Faculty of Engineering Undergraduate Office.

On November 23, 2001, family, friends and colleagues gathered to honour **Dr. Klaus-Peter Schwarz** in his retirement. Dr. Schwarz began his career at the University of Calgary in 1980 and retired December 31, 2001. He was Head of the Department from 1990 - 1995. Dr. Schwarz was appointed as a Professor Emeritus January 1, 2002.

Memories and well wishes were presented by Dr. Ed Krakiwsky, former Head of Geomatics Engineering, Dr. Gerard Lachapelle, Head of Geomatics Engineering, Dr. Chan Wirasinghe, Dean of Engineering, Dr. Len Bruton, former Dean of Engineering and Dr. Naser El-Sheimy, former PhD student of Dr. Schwarz and current faculty member.

Dr. Schwarz opening his gifts

Dr. Schwarz with current and former students and research assistants: Back L to R: Michael Kern, Sameh Nasser, Ahmed Mohamed, Aboelmagd Noureldin Sitting LtoR: Naser El-Sheimy, Klaus-Peter Schwarz, Sandra Kennedy, Ming Wei.

Klaus-Peter with former Dean Len Bruton (left) and Dean Chan Wirasinge right)

Professor Emeritus

Dr. J.A.R. Blais, B.Sc. (Honours; Silver Medal; Hamilton Award), M.A., Ph.D. (University of New Brunswick), P.Eng. Estimation, spectral analysis, information theory and systems numerical methods, reference systems and gravitation.

Dr. E.J. Krakiwsky, Dipl. Land Surv., B.Sc. (Honours Roll), M.Sc., (Wild Heerbrugg Award), Ph.D. (Heiskanen Award; The Ohio State University), P.Eng. Least squares estimation and statistical testing, network design, satellite positioning, automatic vehicle location and navigation systems.

Dr. A.C. McEwen, LL.B., LL.M., Ph.D. (University of London), C.L.S., N.L.S., Cadastral studies, survey law, land registration systems, international land and maritime boundaries surveys for aboriginal land claims.

Dr. K.P. Schwarz, Dipl.Ing., M.Sc. Dr.-Ing. (Summa cum laude; Technical University of Berlin), P.Eng., Geodesy, inertial techniques, airborne gravimetry, kinematic positioning and attitude determination by GPS/INS, multi-sensor systems, real-time applications.

Geomatics Engineering Professor Emeriti: LtoR: Rod Blais, Ed Krakiwsky, Alec McEwen, Klaus-Peter Schwarz

Adjunct Professors

Dr. Mike Chapman
Ryerson Technical University

Dr. Shawn Marshall
University of Calgary

Dr. Oleg Salychev
Moscow Technical University

Dr. Bruno Scherzinger
Applanix Corporation

Dr. Vincent Tao
York Univeristy

Support Staff

Administrative

Ms. Marguerite Anderson, Administrative Manager
Mrs. Monica Barbaro, Secretary /Receptionist
Mrs. Marcia Inch, B.A., Administrative Assistant
Mrs. Julia Lai Leung, Administrative Secretary
Ms. Tamara McCarron, B.Sc, Program Coordinator, SCiberMENTOR Program
Mrs. Lu-Anne Schaffland, Graduate Program Administrator

Technical

Mr. Kirk Collins, B.Sc, Survey Technician, Dipl.Surveying & Mapping Technology
Mr. Brad Groat, Dipl. in Electronics Engineering Technology, B.A., Computer Systems Administrator
Ms. Gail Leask, Dipl. in Telecomputer Engineering Technology, Microcomputer Lab Administrator
Mr. Garth Wanamaker, B.Sc, Technical Manager/ Photogrammetric Technician
Ms. Carol Wulfman, B.Sc, CNE, CCNA, Computer Technician

Research Associates/ Assistants

Christian Gruber
Gravity Field

Vickie Hoyle
Positioning, Location and Navigation

Bart Hulshof
Geospatial Information Systems

Anna Jensen
Positioning, Location and Navigation

Chaunyun Fei
Geospatial Information Systems

Post Docs

Aboelmagh Noureldin
Positioning, Location and Navigation

Visiting Scientists

Gyu-In Jee
Konkuk University, South Korea

Chang Wan Jeon
Soonchunhyang University, South Korea

Quanke Wang
Distributed Geospatial Information Systems

Guest Lecturers

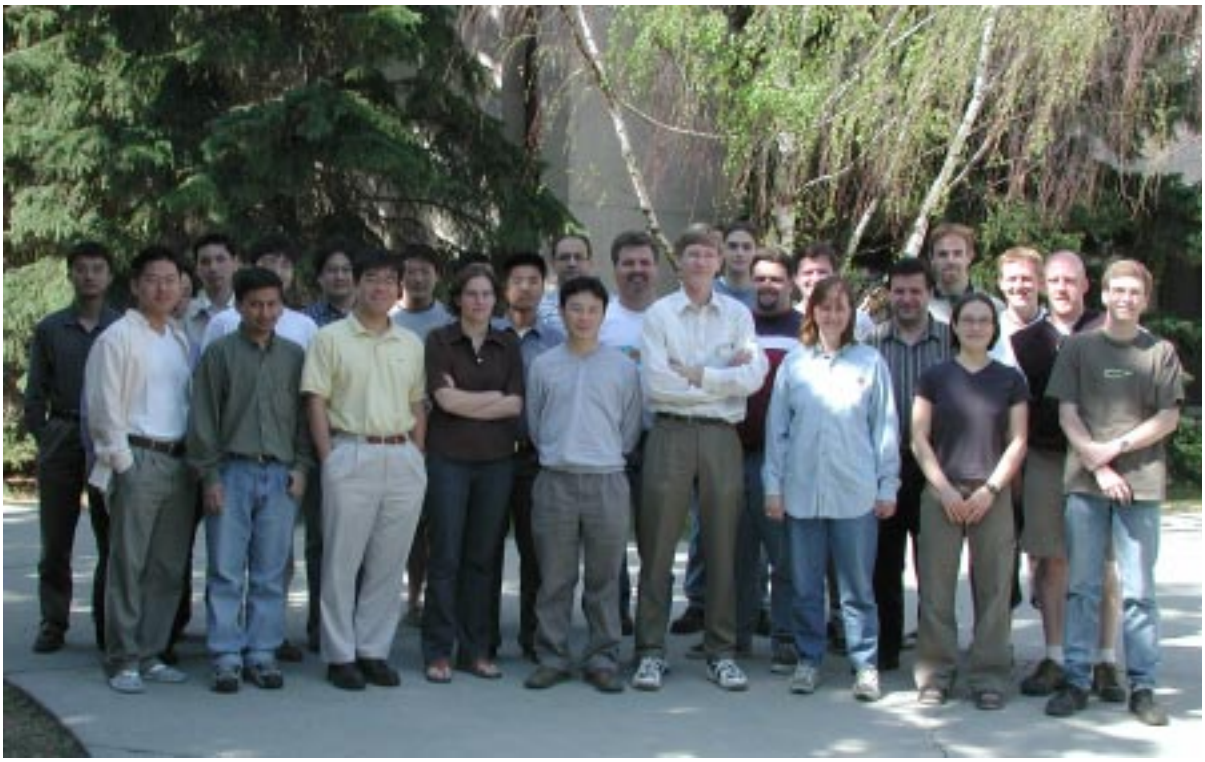
DISTINGUISHED LECTURE SERIES

Dr. Karl-Rudolf Koch
Rheinische Friedrich-Wilhelms-Universitaet Bohn
Bayesian Statistics

Dr. John Raquet
Air Force Institute of Technology
GPS Receiver Design

Dr. Oleg Salychev
Bauman Technical University
Inertial Navigation Systems in Geodetic Applications

Dr. Peter Teunissen
Delft University of Technology
Theory & Application of GNSS Carrier Phase Ambiguity Resolution



Dr. Peter Teunissen (fourth from the right) with graduate students enrolled in his graduate course on Theory & Application of GNSS Carrier Phase Ambiguity Resolution

Dr. John Raquet (3rd from the left, kneeling) with graduate students enrolled in his graduate course on GPS Receiver Design

INTERNATIONAL LECTURE SERIES

Dr. Ian Dowman
University College, London, UK
Advanced Research on Processing of High-Resolution Imagery, Lidar and InSAR Data

Prof. Per Enge
Stanford University, USA
Landing Airplanes Using Satellite Signals

Dr. Rüdiger Haas
Chalmers University of Technology, Sweden
Crustal Motion in Europe Observed with Space Geodetic Techniques

Dr. Ayman Habib
Ohio State University, USA
Automatic Co-registration and Change Detection between Multiple Data Sets

Dr. Timothy James
University of Leeds, UK
DEM Quality and Application in a Modern Context

Dr. Changno Lee
Purdue University, USA
Road Extraction from Remote Sensing Data

Dr. Samsung Lim
Inha University, Korea
Object Oriented Component Programming in Geomatics

Dr. Isabella Velicogna
University of Colorado, USA
Satellite Measurements of Time Variable Gravity: What Can They Tell Us About the Earth?

SPECIAL LECTURE SERIES

Dr. Richard Klukas
Cell-Loc Inc., AB
Network-Based Celluar Telephone Positioning

Dr. Bruno Scherzinger
Applanix Corporation, ON
Applanix GPS-Aided INS Technology and Products

Ian Dow, University College London, with faculty and students who attended his presentation

ADVISORY COMMITTEE AND STUDENT AWARDS

Advisory Committee

It is the responsibility of the Geomatics Advisory Committee to ensure that the undergraduate, graduate and research programs meet the needs of the country and are kept up to date with society and the rapidly changing technologies.

Back LtoR: Gerard Lachapelle, Pieter Leenhouts, Stephen Barnett, Stephen Green, Jim George, Doug Reid, Steve Taylor, Seated LtoR: Susan Skone, Diane Coleman, O'Brian Blackall, Vicky Brilz

The 25th annual advisory committee meeting was held on November 2, 2001. The agenda included discussion on marketing, Career Day 2002, career opportunity diversification, internship opportunities, student summer jobs and employment for Spring 2002 graduates. The committee also met with third and fourth year student representatives.

Advisory Committee 2001/2002	
Name	**Affiliation**
Doug Reid, Chair	Leica Geosystems, Calgary, AB
Stephen Barnett	Challenger Geomatics Ltd., Calgary, AB
O'Brian Blackall	McElhanney Land Surveying Inc., Fort St. John, BC
Vicky Brilz	Dynastream, Calgary, AB
Diane Coleman	Earth Observation Service, Calgary, AB
Eric Desroches	ASI Technologies, Colorado Springs, CO
Jim George	Cell-Loc, Calgary, AB
Stephen Green	The Cadastral Group Inc., Calgary, AB
Denis Hains	Geomatics Canada, Ottawa, ON
Pieter Leenhouts	Canadian Coast Guard, Ottawa, ON
Steve Taylor	Canadian Geomatic Solution Ltd., Calgary, AB
Representatives of the UofC were M.J. Collins, G. Lachapelle, S.H. Skone	

Geomatics Engineering Liaison Committee

Geomatics Engineering Liaison Committee 2002	
Name	**Affiliation**
Ken Allred	Alberta Land Surveyors Association
Hans Troelson	Corporation of British Columbia Land Survyeors
O'Brian Blackall	Corporation of British Columbia Land Survyeors
Ross Woolgar	Alberta Land Surveyors Association
Jeff Skelton	Saskatchewan Land Surveyors Association
Chris Korrel	Association of Manitoba Land Surveyors
Patrick Ringwood	Association of Canada Lands Surveyors
Paul Dixon	Association of Canada Lands Surveyors
Representatives of the UofC were M.J. Collins (Chair), M.E. Rakai, W.F. Teskey	

The Geomatics Engineering Liaison Committee met on November 2, 2001 and February 6, 2002. The committee was established to develop an effective and permanent relationship between the Land Surveyors' Associations and the University of Calgary. The committee consists of two delegates each from the Land Surveying Associations in the four western provinces and the Association of Canada Lands Surveyors as well as the Associate Heads and Cadastral faculty of the Department of Geomatics Engineering at the University of Calgary.

Discussions centred around the 1) land surveying modules that were given during Field Camp held in August and what changes could be made 2) student recruitment and awareness of the Land Surveying professional direction 3) ALSA guest presentations to students during ENGO 500 and other ENGO courses 4) purpose of the Committee

Student Awards Night

Student Awards Night was held on Thursday, November 1, 2001. Awards night is an opportunity to publicly recognize the many accomplishments of our graduate and undergraduate students. It also provides an occasion for an informal meeting between members of the profession, students, faculty and other university representatives.

The number of awards available for our students continues to rise thanks to the commitment of the Geomatics community to our program and to our students.

Undergraduate Awards University Wide

Recipient	Awards
Steven Van Berkel	J.H. Holloway Scholarship in Geomatics Engineering
Mark Theuerkauf	British Columbia Land Surveyors Award
Lesley Ewoniak	L.R. (Dick) Newby Memorial Award
Christopher Kuntz	Saskatchewan Land Surveyors Award
Trevor Dempsey	Bryan I. Dreger Award
Rita Cheng	LEICA Canada Ltd. Scholarship
Adam Wojciechowski	The McElhanney Scholarship
Lesley Ewoniak	Stephen P. Williams Memorial Award
Raymond Tsoi	Wright Focus Engineering Scholarship
Benjamin Giesbrecht	The Cannon-Lachapelle Family Scholarship
Jeremy Allan	Motorola GPS Scholarship
Michael Wollershim	KIS97 Undergrad Scholarship
Jason Kang	The E.J. Krakiwsky Bursary
Mark Theuerkauf	H. Roy Goldfinch Memorial Award
Jason Kang	Institute of Navigation Alberta Chapter Bursary
Kevin Macgowan	David Scovill Memorial Bursary
Mark Woychuk	Alberta Land Surveyors' Association Bursary
David MacDonald	Canadian Geomatic Solutions Ltd. Bursary
Amy Simmons	A.D. (Denis) Hosford Scholarship
Darren Nikkel	Ray Lowry Memorial Bursary

Some of the Graduate and Undergraduate Award Winners

Enjoying Awards Night

Graduate Awards	
Walid Abdel-Hamid	Egyptian Government Scholarship
Mohamed Abdel-Salam	Tuition fees Scholarship
Luiz Paulo Fortes	CAPES, Brazilian Federal Government
Georgia Fotopolous	NSERC Scholarship iCore Supplement Tuition fees Scholarship Amelia Earhart Honorary Izaak Walton Killiam Memorial
Yong Hu	University of Calgary Silver Anniversary Graduate Fellowship Altenhofen Memorial Scholarship Award
Sandra Kennedy	NSERC Scholarship iCORE Supplement
Michael Kern	Helmut Moritz Graduate Scholarship
Glen MacGougan	NSERC Scholarship iCORE Supplement Tuition fees scholarship
Sameh Nassar	L. R. (Dick) Newby Memorial Award
Kyle O'Keefe	NSERC Scholarship iCORE Supplement ION Scholarship
Mark Petovello	KIS-94 Graduate Scholarship NSERC Scholarship iCORE Supplement Tuition fees scholarship
Samantha Poon	Tuition fees scholarship
Rebeca Quinonez-Pinon	Universidad Antonoma Metropolitana Consejo Nacional De Ciencia Y Tecnologia
Rob Radovanovic	NSERC Scholarship Honorary Izaak Walton Killam Memorial Ralph Steinhauer Award of Distinction
Mohammad Ali Rajabi	Ministry of Culture and Higher Education (MCHE) PhD Scholarship
Nadia Shahriari Namini	World Fellowship Grant , Delta Kappa Gamma Society International Graduate Faculty Council Scholarship
George Vergos	Graduate Faculty Council Scholarship
Wentao Zhang	Tuition fees scholarship
Paul Alves Kyle O'Keefe	ION Student Paper Award
Michael Kern	IAG Best Oral Presentation by a Student
Sameh Nassar	Geoide Network PCI Geomatics Student Best Paper Award
Total Awarded	**$290,719**

Best paper awards were also won for papers co-authored by graduate students and faculty
Please see Awards and Recognition section of page 3 for details.

Our graduate students achieved over $290,000 in awards for 2001/2002. This figure is excluding graduate teaching assistantships and graduate research scholarships.

WOMEN IN ENGINEERING AND SCIENCE

During the 2001-2002 term, the NSERC/Petro-Canada Chair for Women in Science and Engineering, held by Professor M.E. Cannon, launched SCIberMENTOR which is an email mentoring system that links Alberta girls aged 11 to 18 with women science and engineering students, as well practicing engineers and scientists. This initiative is in collaboration with the Faculty of Engineering, University of Alberta and the Alberta Women's Science Network (AWSN). The project is being funded by Alberta Innovation and Science with matching funds by EnCana Corp. The goals of the program are to increase awareness of the opportunities and benefits of, and successful paths to, careers in science and engineering fields, and to increase the participation of young women in high school science and math courses. Additionally, the program is designed to increase the participation of young women in college and university science and engineering programs, and to acquire data that will build on knowledge of the perceptions of maths and science, career interests and future plans of girls throughout Alberta.

Two Program Administrators have been hired, with Tamara McCarron being at the University of Calgary, and Monica Das at the University of Alberta. Matching protocols, communications materials and web content (www.scibermentor.ca) were developed and the program now has over 350 participants. A research project has also been launched in collaboration with Dr. Judy Lupart in the Faculty of Education, so the impact of the program on the mentors and mentees can be measured. This program is unique in its size and scope in Canada.

Another highlight of the year was the *Prairie Women in Science and Engineering Conference* that was held on October 26 and 27, 2001 at the University of Calgary. This conference brought together over 180 students, teachers, academics, as well as gov-

ernment and industry stakeholders from the Prairies to share intervention strategies and success stories for attracting and retaining women in these fields, to provide opportunities for all attendees to develop personally and professionally through networking and personal development workshops, and to present findings from research being conducted by Prairie scholars on women in science and engineering issues.

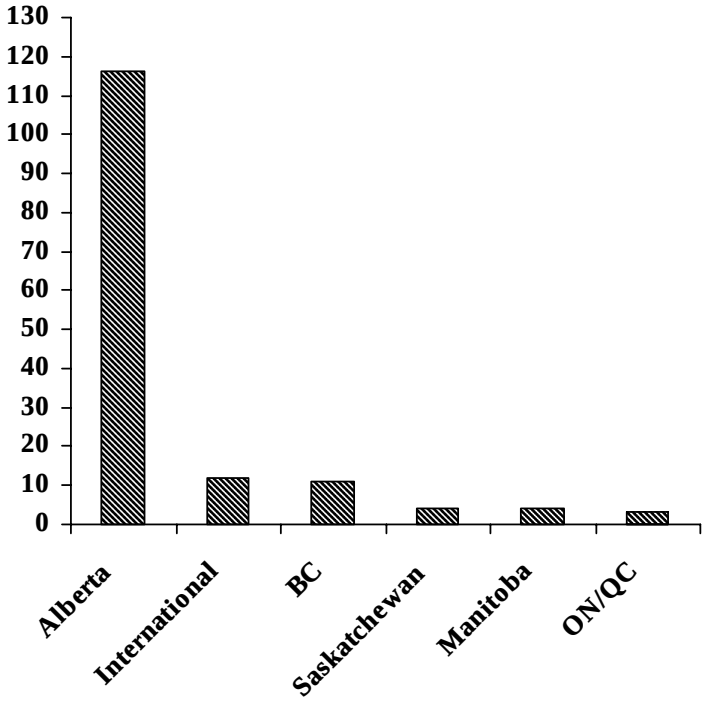
Conference sessions were planned around various women in science and engineering issues including K-12, university and college programs, graduate and faculty issues, and retention of women in industry. Paper presentations were given along with discussion sessions to focus on winning strategies and best practices. Workshops were also held on topics of interest to the attendees (e.g. 'Being Successful in the Workplace', 'Gender Communications'). Keynote addresses were given by leading women scientists and engineers, including Kathy Sendall, Senior VP of Petro-Canada and Catherine Hughes, Calgary GeoMarket Manager for Schlumberger.

Hon. Victor Doerksen, Minister of Alberta Innovation and Science, welcomes attendees to the Prairie Conference on Women in Science and Engineering

For Information on the SCIberMENTOR program visit www.scibermentor.ca

UNDERGRADUATE STUDIES

Enrollment



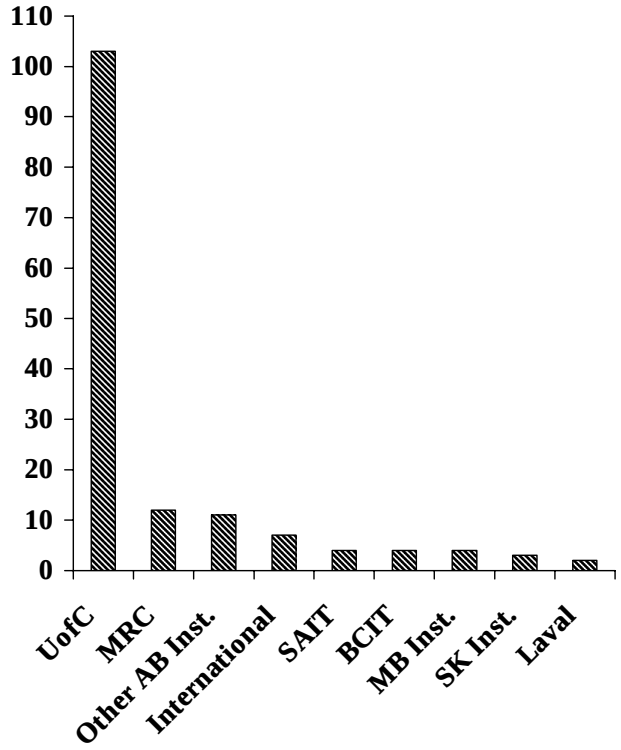
Student Enrollment by Geographic Region

During the 2001/02 academic year 150 undergraduate students pursued studies in Geomatics Engineering at the UofC (see tables on page 28-29).

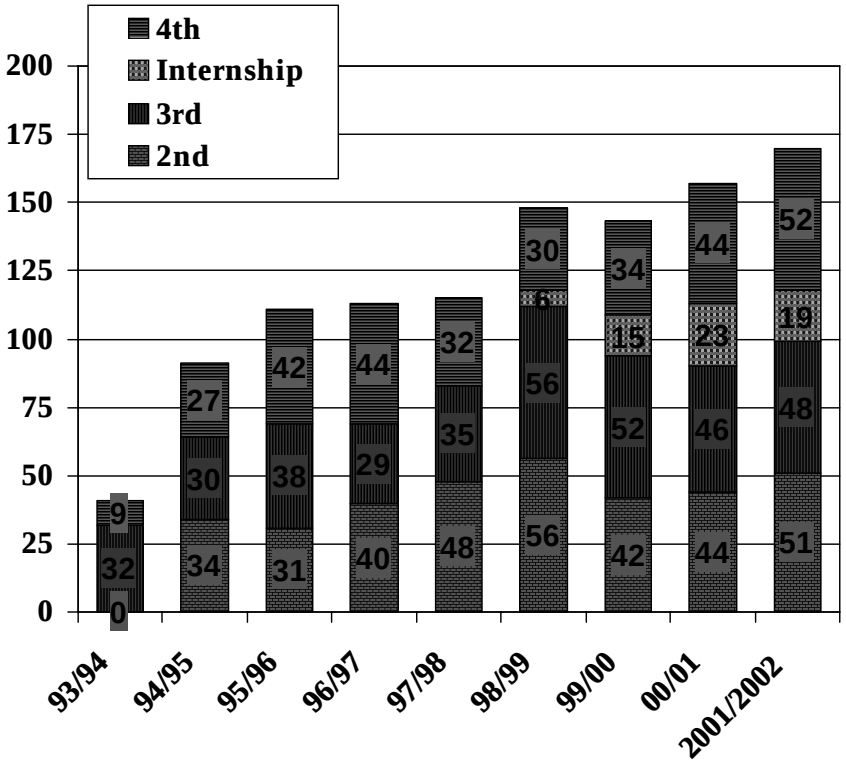
The Department has seen a steady increase in undergraduate enrolment over the past seven years (see graph on page 28). The program's cap (maximum enrolment per year) increased from 35 to 50 during the past four years.

The figure to the left shows a breakdown of student enrollment by geographic region.

A representation of enrollment statistics by post secondary institution is shown in the adjacent figure. Alberta post-secondary institutions listed under Other AB Institutes include Red Deer College, University of Alberta, Athabasca University and NAIT. MB Institutes include Red River College, University of Manitoba and University of Winnipeg, Saskatchewn include University of Regina, University of Saskatchewan and SIAST.



Student Enrollment by Previous Post-Secondary Institution



Undergraduate enrolment 1993/94 to 2001/2002

Fourth Year Students			
Akehurst, William	*Allesch, Michael	Barabas, Maria	Barich, Jessica
Bytnar, Magdalena	Carels, Jesse	Chan, Michelle	Cheng, Rita
Chin, Samantha	*Chouinard, Eric	Copithorne, Gord	Crawford, Scott
De La Cruz, Alonzo	Dempsey, Trevor	*Duguay, Jean	Ewoniak, Lesley
Fehr, Jeff	Gordon, Anjanette	Grover, Kevin	*Gruber, Christian
*Hesselbjorg, Jacob	Holloway, Adam	Hoyle, Vickie	Huang, Andrew
Huang, Hua	Jee, Jaime	Knight, Dave	Kubacki, Wojciech
Kuntz, Christopher	Kwong, Cynthia	Lee, Randolph	Marshall, Craig
Martin, Michelle	Motz, Troy	Odhwani, Murnir	Parkinson, Courtenay
Pinkerton, Rob	Reid, Christopher	Richert, Todd	Robinson, Kerri
Roesler, Greg	Sharma, Jayanti	Shenoy, Shiva	Siu, Javier
Sonpal, Nikhil	Studer, Sean	Suderman, Cary	Theuerkauf, Mark
Trevis, Landra	Van Berkel, Steven	Woychuk, Mark	
TOTAL: 51			
* Visiting			

Third Year Students			
Allan, Jeremy	Anderson, Teresa	Blatz, Jefferey	Boulanger, Scott
De Groot, Lance	Doney, Dallin	Elsayed, Brian	Fox, Tyler
Glass, Natalie	Glass, Robert	Hansen, Tyler	Ho, Aaron
Ho, Tony	Hocker, Benjamin	Holder, Cody	Hooper, Jonathan
Howden, Jeremy	Hyatt, Stephen	Johnson, Andrea	Kalmanovitch, Daniel
Klein, Jason	Kuzek, Dallas	Lee, Jina	Loo, Derek
Madejski, Mariusz	McEachern, Michael	Movassagh, Tandis	Natt, Irwindeep
Nemrava, Kevin	Neufeld, Jonathon	Parmar, Davinder	Pyc, Jack
Rangayyan, Vidya	Schick, Tyson	Shayestehfar, Kiarash	Szeto, Sabrina
Temraz, Sawsan	Tsar, Chun Yeung	Tsoi, Raymond	Turner, Christopher
Vanderwey, Matthew	Vincendeau, Rachel	White, Craig	Wong, Jason
Wong, Johnny	Wong, Kin Yan	Woodhouse, Daniel	Yoon, Chang Bae
TOTAL: 48			

Second Year Students			
Abdelrahman, Mamoud	Adair, Jeffrey	Ashton, Christopher	Barrett, Michelle
Basrak, Zdravka	Beblow, Terry	Braseal, Ryan	Broadbent, Michael
Carter, Jack	Chu, Thien Chi	Colpitts, Christopher	Colpitts, Jennifer
Dixon, Luke	Dixon, Ryan	Forrester, Lindsay	Forsyth, Matthew
Fraser, Michael	Giesbrecht, Benjamin	Gordon, Ryan	Huber, Colin
Kang, Jason	Latos, Andrea	Lippitt, Warren	Lloyd, Aaron
Louie, Michael	Lui, Robert	Luu, John	Mansour, Vivianne
Mauch, Jesse	Mckee, Donald	McKellar, Ryan	Metheral-Christ, Andrew
Na, Thomas	Nastiuk, Andrew	Nikkel, Darren	Plante, Justin
Prescot, Sara	Rasmussen, Johnathon	Somborovic, Vanesa	Thompson, Michael
Tippett, Natasha	Tong, John Ka Lung	Wards, Sandra	Wetherup, Patrick
Wollersheim, Michael	Wong, Sheena	Yang, Ying Di Diana	Yap, Ernest
Yazdani, Kambiz	Yu, Leonard		
TOTAL: 50			

Common Core Curriculum

The common curriculum for engineering students is shown in the adjacent table.

Students choose their department at the end of the first year and begin studies specific to that Department in their 4th term.

COMMON PROGRAM FOR ALL ENGINEERING STUDENTS

Year 1	Course Name		Term Course Offered In
	AMAT 217	Calculus for Engineers & Scientists	F
	AMAT 219	Multivariable Calculus for Engineers	W
	CHEM 209	General Chemistry for Engineers	F/W
	ENGG 201	Behaviour of Liquids, Gases & Solids	F/W
	ENGG 203	Statics	F
	ENGG 215	Engineering Design, Practice & Communication	W
	ENGG 233	Computing for Engineers I	W
	ENGG 249	Dynamics	W
	MATH 221	Linear Algebra for Scientists & Engineers	F
	PHYS 259	Electricity & Magnetism	W
	PHYS 269	Acoustics, Optics, Radiation	F
	Depending on assigned program, students will be registered in five half courses in one term and six half courses in the other term.		
Year 2 (Fall)			
	AMAT 307	Differential Equations for Engineers	F
	ENGG 313	Engineering Drawing & Computer Graphics	F
	ENGG 319	Probability & Statistics for Engineers	F
	ENGG 325	Electric Circuits & Systems	F
	ENGG 335	Computing for Engineers II	F
	Abbreviations		
	AMAT	Dept. of Math. and Stats.	
	CHEM	Dept. of Chemistry	
	PHYS	Dept. of Physics	
	ENGG	Faculty of Engineering	
	ENGO	Dept. of Geomatics Engineering	

Undergraduate Curriculum in Geomatics Engineering

UNDERGRADUATE CURRICULUM IN GEOMATICS ENGINEERING			
Year 2/Winter	**Course**		**Stream**
	AMAT 309	Vector Calculus for Engineers	
	ENEL 327	Signals and Systems	
	ENGO 343	Fundamentals of Surveying	Surveying
	ENGO 351	Introduction to Land Information Systems (LIS)	Land Studies
	ENGO 361	Adjustments of Observations	Methodology
	ENGG 003	Block Course/Environment, Health and Safety	
	ENGO 001	Block Course	
	COST-1	Complementary Study	
Year 3/Fall	**Course**		**Stream**
	ENCI 471	Introduction to Project Management	Methodology
	ENGG 407	Numerical Methods	Methodology
	ENGO 421	Fundamentals of Geodesy	Geodesy
	ENGO 431	Photogrammetry	Photogrammetry and Remote Sensing
	ENGO 455	Cadastral Surveys & Land Systems	Land Studies
	ENGO 002	Block Course	
	COST-2	Complementary Study	
Year 3/Winter	**Course**		**Stream**
	ENGO 423	Geodetic Positioning	Geodesy
	ENGO 427	Gravity Field	Geodesy
	ENGO 435	Physical Principles of Remote Sensing	Photogrammetry and Remote Sensing
	ENGO 459	Design & Implementation of Geospatial Information Systems	Land Studies
	COST-3	Complementary Study	
Year 4/Fall	**Course**		**Stream**
	ENGG 513	Role & Responsibility of Prof. Engineers in Society	Practical
	ENGO 500	Geomatics Engineering Project	Practical
	ENGO 501	Field Surveys	Practical
	ENGO 545	Hydrography	Surveying
	TE-1	Technical Elective	Choose from Technical Electives
	TE-2	Technical Elective	Choose from Technical Electives
	COST-4	Complementary Study	
Year 4/Winter	**Course**		**Stream**
	ENGO 500	Geomatics Engineering Project	Practical
	ENGO 519	Geomatics Networks	Surveying
	TE-3	Technical Elective	Choose from Technical Electives
	TE-4	Technical Elective	Choose from Technical Electives
	COST-5	Complementary Study	

The first year and a half (three terms) of common core subjects are followed by two and a half years (five terms) which concentrate on geomatics related subjects. The curriculum for the remaining five terms is shown in the adjacent table.

TECHNICAL ELECTIVES
GEOMATICS ENGINEERING

Course		Stream
ENGO 559	Digital Imaging and Applications	Photogrammetry & Remote Sensing
ENGO 561	GPS	Positioning, Location and Navigation
ENGO 563	Data Analysis in Engineering	Geodesy
ENGO 567	High-Precision Surveys	Surveying
ENGO 573	Digital Terrain Modelling	Photogrammetry & Remote Sensing
ENGO 579	Survey Law	Land Studies
ENGO 581	Land Use Planning	Land Studies
ENGO 583	Environmental Modelling	

Geomatics Engineering Student Society (GESS)

President: Samantha Chin
Vice-President: Jon Neufeld
Treasurer/Secretary: Jayanti Sharma
VP Events: Kevin Grover
VP Academic: Kerrie Robinson
VP Sports: Andrew Huang
3rd year rep: Aaron Ho
4th year rep: Mark Woychuck
Career Day Coordinator: Michelle Martin

Faculty showed incredible team spirit by helping GESS earn some points for ENGG week

Undergrad student Leslie Ewoniak gives Dr. Michael Collins a new do.

Geomatics Engineering undergraduate students won ENGG Week 2002. Above Dave Knight (L) and Kevin Grover (R) display the ENGG Week Trophy. A great effort was made by students and faculty.

ENGO 500

The objective of the ENGO 500 group project course is development of skills in cooperative research, report preparation and seminar presentation. Students plan and execute a project that must conform with professional requirements. The project must have design, measurement, analysis and presentation components. Submission and defence of progress reports and a final report are required. The Department awards a prize to the group with the best project. This year we had two winners: K. Grover, A. Holloway, G. Roesler, G. Copithorne and J. Sharma, A. Huang, K. Robinson, M. Martin.

ENGO 500 Special Presentations

Dr. Janaka Y. Ruwanpura
Dept. of Civil Engineering, UofC
Fundamentals of Project Management

Brian E. Munday
Alberta Land Surveyors' Association
Client Relations

Steve Barnett
Challenger Geomatics
Challenger Geomatics and the Geomatics Industry in Canada

Dr. Bryan Mercer
Intermap Technologies Corp.
Digital Elevation Models from IFSAR and LIDAR

Roy Palmindale & Ashley Robertson
The Focus Corporation
Geomatics Employment Opportunities

Doug Reid
Leica Geosystems
The Leica Innovation Process (LIP)

Vicki Brilz
Dynastream Innovations Inc.
The Journey from Technology to Market

ENGO 500 Projects (2001/02)

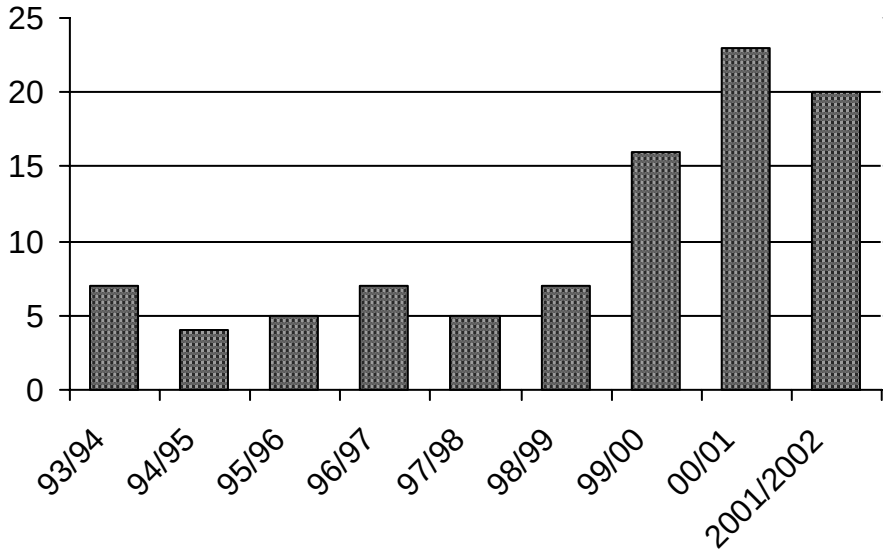
Project Title	Group Members	Supervisor
Analysis of DGPS Corrections and Availability for Single Point Postioning and Mapping Applications	M. Dempsey S. Studer A. Gordon C. Reid	R.W. Klukas
DGPS MAX Performance Analysis	M. Chan C. Kwong J. Jee R. Lee	S.H. Skone
Performance Analysis of Several Wide Area Differential Gobal Positioning System Services	M. Odhwani S. Shenoy A. De La Cruz	Y. Gao
Bore Sight Calibration for Mobile Mapping Systems	K. Grover A. Holloway G. Roesler G. Copithorne	N. El-Sheimy
A Gravity Model Using CHAMP	W. Kubacki R. Pinkerton J. Carels	N.J. Sneeuw
Symons Valley: A Study in Sustainable Urban Development	L. Ewoniak C. Kuntz M. Theuerkauf S. Van Berkel	W.F. Teskey M.E. Rakai (from 01/2002)
Densification of Provincial DEM Data in Waterton and Comparison of Different Interpolation Methods	J. Siu H. Huang K. Riedel	J.A.R. Blais
A Comparison of Deformation Monitoring Techniques Using the Leica TCA2003 Robotic Theodolite	J. Barich T. Motz M. Woychuk J. Fehr	W.F. Teskey
The Modelling of Snow Covered Area in Northern Manitoba Using Satellite Imagery	J. Sharma A. Huang K. Robinson M. Martin	C. Valeo
The Calgary Urban Heat Island Project	D. Knight L. Trevis T. Richert	I. Couloigner
Geospatial Modeling of Biodiversity in Boreal Forest	S. Chin M. Bytnar S. Crawford M. Barabas	M.J. Collins
Road Network Extraction Using Edge Detection	W. Akehurst C. Suderman N. Sonpal C. Parkinson	I. Couloigner

Engineering Internship Program

Geomatics Internship Students 2001/2002		
Name	**Placement Company**	**Faculty Mentor**
Audette, Ryan	The Airborne Sensing Corporation, Toronto, ON	I. Couloigner
Barvir, Adam	Autodesk, Inc., Calgary, AB	M.P. Tait
Burke, Ryan	Analytical Surveys, Inc., Colorado Springs, CO	S.H. Skone
Cheng, Rita	Autodesk Inc., Calgary, AB	M.P. Tait
Clement, Barry	Jurukur Perunding SDN.BHD, Kuala Lumpar, Malaysia	W.F. Teskey
Kwan, Ngai Man	Fisheries & Oceans Canada, Burlington, ON	S.H. Skone
Langen, Daniel	Aerotec, Bassemer, AL	M.J. Collins
Langen, Douglas	University of Calgary, Calgary, AB	G. Lachapelle
Lee, Melissa	Autodesk Inc., Calgary, AB	C. Valeo
MacDonald, David	Waypoint Consulting Inc., Calgary, AB	Y. Gao
Magowan, Kevin	CDL Systems, Calgary, AB	R.W. Klukas
McAllister, David	Novatel Inc., Calgary, AB	G. Lachapelle
Prokopetz, Michael	Halliburton Subsea, Houston, TX	M.G. Sideris
Pullivelli, Anoop	Autodesk, Inc., Calgary, AB	N. El-Sheimy
Sereda, David	Geotrech Land Survey Ltd., Calgary, AB	C. Valeo
Simmons, Amy	Mentor Engineering Inc., Calgary, AB	W.F. Teskey
Sinanan, Leannah	StanTech Consulting Ltd., Calgary and Red Deer, AB	S.H. Skone
Tse, Chi Fu	Cell-Loc Inc., Calgary, AB	R.W. Klukas
Wojciechowski, Adam	Intermap Technologies, Calgary, AB	N. El-Sheimy
Yousuf, Ruben	TransCanada Pipelines Ltd., Calgary, AB	Y. Gao

This program offers an optional co-operative educational work experience for all students who have completed in the third year of engineering. Participants spend 12 to 16 months in paid jobs.

The number of internship placements has grown in the department from seven in 1993/94 to 20 in 2001/2002 as shown in the graph below.



Number of Internship Students Placed 1993/94 to 2001/02

Geomatics Engineering Career Day

On February 7, 2002, the Geomatics Engineering Student's Society and the Department of Geomatics Engineering hosted their seventh annual Career Day. Career day provides a forum for both companies and students to interact and discuss topics and career opportunities in the Geomatics industry. Several guest speakers made presentations on various topics throughout the day. In addition to these presentations, students and company representatives participated in the Industry Showcase, which was introduced to provide all participants with an opportunity to discuss careers in Geomatics.

The Geomatics Engineering Student's Society would like to thank all participants and sponsors for making Career Day a success.

Career Day Participants	
Aerotec	GeoArctic
AGG	Intermap Technologies Corp.
Alberta Land Surveyors' Association	Leica
ALL-CAN Engineering & Survey	Maltais Associates Surveyors Ltd.
AltaLis	Martin Newby
Applanix Corporation	McElhanney Land Surveys Ltd.
Autodesk Development Canada	McGregor Resource Analysis Group
Canadian Geomatic Solutions Ltd.	Mosaic Mapping
CanAm	Geomatics Canada (NRCan)
Challenger Geomatics Ltd.	NovAtel Inc.
BC Land Surveyors ' Association	Pixxures Canada Inc.
Eagle Navigation Systems Inc.	Thales Geosolutions Group Ltd.
Focus Corporation	The Cadastral Group Inc.
Fugro SESL Geomatics	Tripod Data Systems
Geoanalytic	

Planning Career Day: Back LtoR: Gérard Lachapelle, Mark Woychuk, Michael Collins, Middle Row: LtoR: Jayanti Sharma, Kuo An Huang, Susan Skone, Kevin Grover, Kevin Nemrava, Seated: LtoR: Samantha Chin, Michelle Martin, Kerri Robinson

Geomatics Engineering Survey Camp at Kananaskis

An important part of the undergraduate degree program in Geomatics Engineering is the field camp (ENGO 501). This two week camp is held at the Kananaskis Centre for Environmental Research prior to the start of the Fall Session. It gives incoming fourth year students the opportunity to apply the knowledge and experience gained in the different areas of geomatics to an integrated practical project.

Winners of the Lost Peg Competition: Back LtoR: Wojciech Kubacki, Magdalena Bytnar, Mark Dempsey, Front: Samantha Chin

The Department of Geomatics Engineering would like to thank the following companies for their participation in the annual Survey Camp Equipment Day on Monday, August 21 and for the generous loan of equipment over the duration of Survey Camp:

Butler Survey Supplies Ltd.
Cansel Survey Equipment
Leica Geosystems Inc.
NovAtel Inc.
Southern Alberta Institute of Technology

Students and instructors at Survey Camp 2001

GRADUATE STUDIES

Enrollment

The number of graduate students remained fairly steady with a total of 69 students (59 full time, 9 part time and 1 visiting). During the academic year 2001/2002, students were either enrolled in the graduate program or finishing their theses. Twenty-one were working towards their PhD degree, 40 towards their MSc degree and 8 towards their MEng degree. Students originated from 14 different countries. There were 12 students that graduated during the reporting period, 1 with a PhD degree, ten with a MSc and one with a MEng. Details are given in the following tables.

Full-Time Graduate Students 2001/2002

Name	MEng	MSc	PhD	Supervisor
Abdel-Hamid, Walid			1	El-Sheimy/Lachapelle
Abdel-Salam, Mohamed			1	Gao
Al-Shafaey, Talal	1			El-Sheimy
Alton, David	1			Collins
Alves, Paul			1	Lachapelle
Bajracharya, Sujan		1		Sideris
Basnayake, Chaminda		1		Lachapelle/MacIar
Bayoud. Fadi		1		Sideris
Chen, Kongzhe		1		Gao
Chiang, Kai-Wei		1		El-Sheimy
de Jong, Michael		1		Collins
Dong, Lei		1		Lachapelle
El-Gizawy, Mahmoud		1		Skone
Ellum, Cameron			1	El-Sheimy
Fei, Chuanyan		1		Tao
Fortes, Luiz Paulo			1	Cannon
Fotopoulos, Georgia			1	Sideris/El-Sheimy
Fox, Ryan		1		Teskey
Grebenitcharsky, Rossen			1	Sideris
Ho, Carrie		1		Valeo
Hopkins, James	1			Teskey
Hu, Yong			1	Tao/Collins
Hunter, Andrew		1		El-Sheimy
Julien, Olivier		1		Lachapelle/Cannon
Kennedy, Sandra		1		Schwarz
Kern, Michael			1	Schwarz
Khan, Khaleel		1		Ballantyne
Lee, Suen		1		Gao
Liu, George		1		Lachapelle
Liu, Junjie		1		Cannon

Full-Time Graduate Students 2001/2002 (continued)

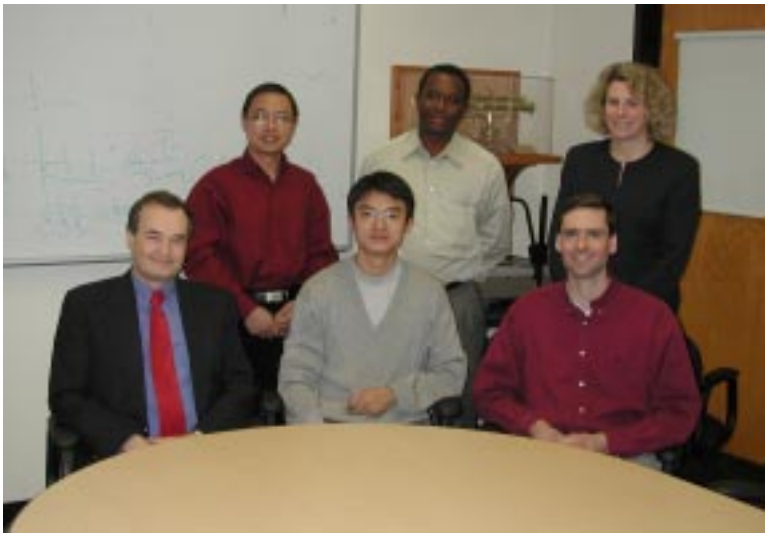
Name	MEng	MSc	PhD	Supervisor
Liu, Zhe		1		Gao
Liu, Zhizhao			1	Gao
Lu, Yan		1		Lachapelle
Ma, Changlin			1	Lachapelle/Klukas
MacGougan, Glenn		1		Lachapelle
Martin, Robert	1			Sideris
Merner, Mark		1		Ballantyne
Moon, Yonjin		1		Skone
Nassar, Sameh			1	Schwarz/El-Sheimy
O'Keefe, Kyle			1	Lachapelle/Skone
Olynik, Michael		1		Cannon
Park, Minha		1		Gao
Petovello, Mark			1	Lachapelle/Cannon
Poon, Samantha		1		Valeo
Provins, Dean			1	Blais
Quinonez-Pinon, Rebeca			1	Collins/Tao
Raaflaub, Lynn		1		Collins
Radovanovic, Robert			1	Teskey/El-Sheimy
Rajabi, Mohammad			1	Blais/Lachapelle
Shahriari Namini, Nadia		1		El-Sheimy/Tao
Shen, Xiaobing		1		Gao
Shin, EunHwan			1	El-Sheimy
Shrestha, Sudhir Man		1		Skone
Vergos, George		1		Sideris
Wang, Chaochao		1		Lachapelle
Watts, Donnalouise		1		Collins
Wright, Bruce		1		El-Sheimy
Zhang, Xiaohong		1		Cannon
Zhang, Wentao		1		Cannon
TOTAL	**4**	**36**	**19**	

Part-Time Graduate Students 2001/2002

Name	MEng	MSc	PhD	Supervisor
Angelo, Joseph	1			Lachapelle/Cannon
Auld, Jonathan	1			Cannon
Bates, Marcia	1			Cannon
Ford, Tomas		1		Schwarz
Jakab, Andy		1		Lachapelle
Manz, Allan	1			Cannon
Morin, Kris		1		El-Sheimy
Ryan, Samuel			1	Lachapelle
Wu, Huming		1		Cannon
TOTAL	**4**	**4**	**1**	
VISITING STUDENTS				
Tocho, Claudia			1	Sideris
TOTAL			**1**	

MSc Defence: Back LtoR: Klaus-Peter Schwarz, Wael Badawy (Electrical Engineering), Mike Chapman, Seated LtoR: MSc Student Cam Ellum , Naser El-Sheimy (Supervisor)

Graduate Studies Convocants 2001/2002				
Name	**Degree**	**Exam Date**	**Graduate Thesis Title**	**Supervisor**
Fadi Bayoud	MSc	Dec 07/01	Local Geoid Determination for Airborne Gravity Data	M.G. Sideris
Cameron Ellum	MSc	Dec 17/01	The Development of a Backpack Mobile Mapping System	N. El-Sheimy
Chuanyun Fei	MSc	Oct 05/01	A Java Implementation for Open GIS Simple Feature Specification	C.V. Tao
Luiz-Paulo Fortes	PhD	Apr 05/02	Optimizing the Use of GPS Multi-Reference Stations for Kinematic Positioning	M.E. Cannon
Andrew Jakab	MSc	July 03/01	Quality Monitoring of GPS Signals	G. Lachapelle
Khaleel Khan	MSc	July 11/01	Land Surveys on Indian Reserves: An Inquiry Into Benefits	B.A. Ballantyne
George Liu	MSc	Dec 07/01	Ionosphere Weighted GPS Carrier Phase Ambiguity Resolution	G. Lachapelle
Robert Martin	MEng	July 10/01	n/a	M.G. Sideris
Mark Merner	MSc	June 26/01	Evaluating Riparian Strips for Sustainability in British Columbia: Possess these shores with me	B.A. Ballantyne
Eun Hwan Shin	MSc	Dec 18/01	Accuracy Improvement of Low Cost INS/GPS for Land Applications	N. El-Sheimy
Georgios Vergos	MSc	Feb 25/02	Bottom Ocean Topography and Marine Gravity Field Modeling	M.G. Sideris
Donnalouise Watts	MSc	Sept 05/01	Land Cover Mapping by Combinations of Multiple Artificial Neural Networks	M.J. Collins



MSC defense. Back LtoR, Yang Gao, Abou Sesay (Electrical Engineering),Elizabeth Cannon, Seated LtoR: Gérard Lachapelle (Supervisor), MSc student Changlin Ma, Richard Klukas

Graduate Seminars - 2001/2002	
Name	**Topic**
Sujan Bajracharya	Terrain-Aliasing Effects on Geoid Determination Usin Different Gravity Reduction Techniques
Fadi Bayoud	Some Practical Aspects in Geoid Determination
Cameron Ellum	The Development of a Portable Mobile Mapping System
Chuanyun Fei	A Java Implementation for OpenGIS Simple Feature Specification
Luiz Fortes	Optimizing the use of GPS Multi-Reference Stations for Kinematic Positioning
	Using a Multi-Reference GPS Station Network for OTF Positioning
Rossen Grebenitcharsky	Altimetry-Gravimetry Boundary Value Problems with Compatibility (Smoothness) Conditions in Coastal Regions
Yong Hu	Investigation on the Rational Function Model for Photogrammetric Processing
Andrew Hunter	Geographic Information Systems, Mobile Computing and Speech Recognition
Andy Jakab	Local Area Augmentation Systems and Evil Waveforms
Sandra Kennedy	Accelerations From GPS: Is There a Better Way?
Khaleel Khan	Land Surveys on Indian Reserves: An Inquiry into Values
George Liu	Ionosphere Weighted GPS Ambiguity Resolution
Zhe (John) Liu	A Java-Based Wireless Framework for Location Based Service Applications
Dean Provins	Giving Old Hardware a New Purpose
Rob Radovanovic	Network Adjustment Of GPS Data For Deformation Monitoring
	Stochatic Modelling Of GPS Error Sources
Mohamed Rajabi	Shape from Shading Using Robust Regularizers
Nadia Shahriari Namini	A New Approach to Minimize Positional Errors in Line Simplification
Eun Hwan Shin	Accuracy Improvement of Low Cost INS/GPS for Land Applications.
George Vergos	Bottom Ocean Topography and Marine Gravity Field Modeling

Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Gravity & Reference Systems	**Positioning & Navigation**	**Photogrammetry & Remote Sensing**	**Precise Engineering Surveys**	**GIS, LIS and Land Tenure**
Geodetic Reference Systems (ENGO 613)	State Models, Kalman Filtering and Smoothing (ENGO 621)	Seminars in Remote Sensing Applications (ENGO 631)	Least Squares Estimation and Analysis (ENGO 629)	Case Studies in Land Information Systems (ENGO 651)
Advanced Physical Geodesy (ENGO 615)	Inertial Surveying and INS/GPS Integration (ENGO 623)	Non-Topographical Photogrammetry (ENGO 635)	Industrial and Precision Alignment Surveys (ENGO 643)	Information Extraction from Digital Imagery (ENGO 655)
Satellite Altimetry and Applications (ENGO 663	Navstar GPS: Theory and Applications (ENGO 625)	Integrated Analysis of Multi-Source Spatial Data (ENGO 637)	Modelling And Optimization Analysis (ENGO 647)	Advanced Spatial Information Systems (ENGO 661)
Global Geophysics and Geodynamics (ENGO 681)	Atmospheric Effects on Satellite Navigation System (ENGO 633)	Digital Stereo Image Processing (ENGO 639)		Advanced Survey Law (ENGO 665)
	Advanced Topics in GPS (ENGO 699.57)	Digital Terrain Modelling & Applications (ENGO 653)		Advanced Land Use Planning (ENGO 699.51)

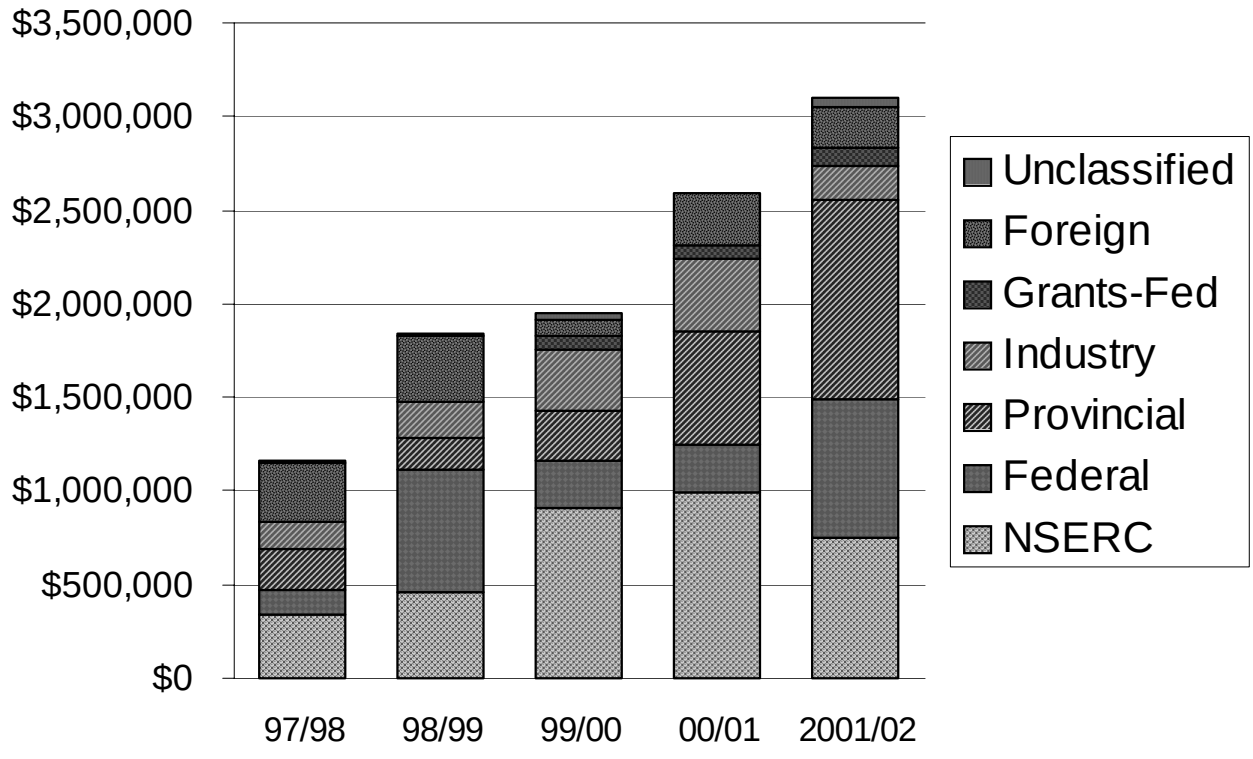
Graduate Students Oleg Mezentsev, Olivier Julien, Lei Dong , RF propogation experiment

RESEARCH

Research Statistics

Research is an integral part of Department activities. It allows individual faculty members to stay at the leading edge of their area of specialization and to apply their knowledge to current problems in industry and government. It also provides funding for research associates and graduate students. It thus supports the education of highly trained future engineers and, in an indirect way, the teaching activities of the Department.

Direct research funding for this report year was at $3,096,133 which is about $238,000 per member (based on 13 faculty members). This continues to be an excellent level of support. Direct research funding increased by over $500,000 for the reporting period.



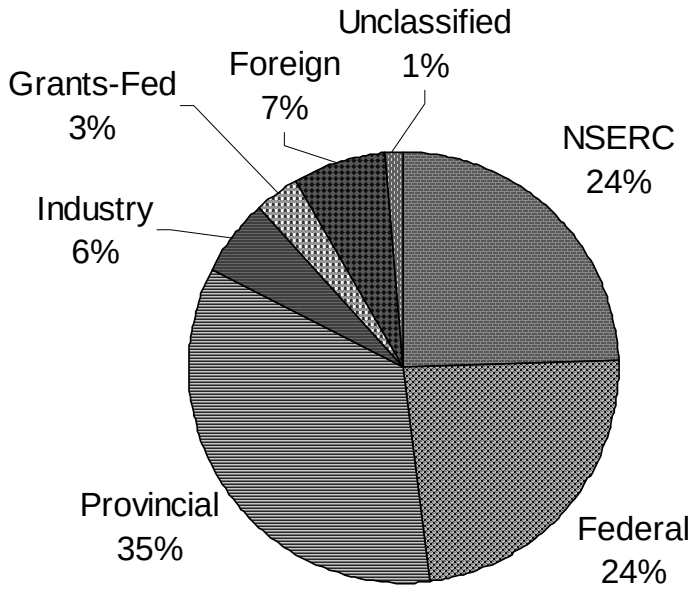
Direct Research Funding by Source - 1997/98 to 2001/02

Figure 1

Research Grants and Contracts for the Period April 1, 2001 - March 31, 2002	
Source	**Amount**
NSERC	753,022
Federal Government	732,982
Federal - Grants	99,615
Provincial Government	1,067,912
Industry	182,897
Foreign Agencies	215,847
Other	43,858
Direct Research Support	*3,096,133*
Research Scholarships	290,719
Indirect Research Support	*290,719*
Total Research Support	**3,386,852**

Table 1

Besides direct research funding, there is indirect research support available in terms of student scholarships and in-kind donations. When added to the direct project funding, see Table 1, the total research for the reporting period is $3,386,852. Figure 1 shows direct research funding for the last five years and Figure 2 shows the research funding by source for 2001/2002.



Direct Research Funding by Source - 2001/02

Figure 2

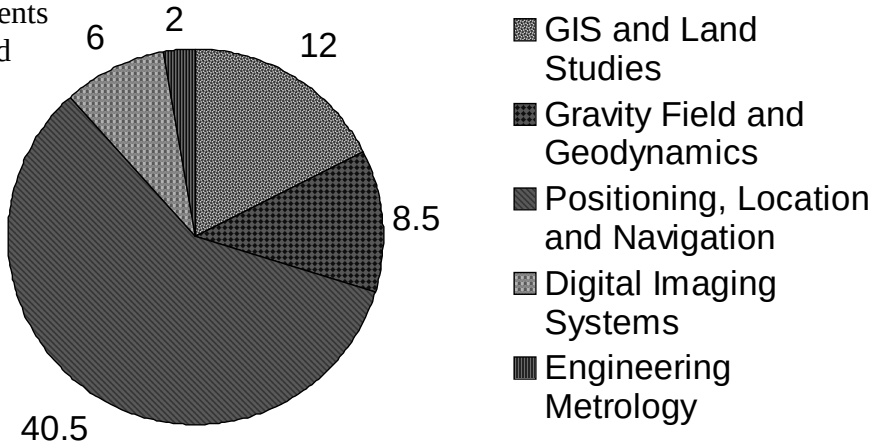
Major Research Areas

The five major research areas in the Department and the names of faculty members who worked on major projects in each area are listed in the following table.

Positioning, Location and Navigation
M.E. Cannon, N. El-Sheimy, Y. Gao, R.W. Klukas, G.. Lachapelle, K.P. Schwarz, S.H. Skone,
Gravity Field and Geodynamics
J.A.R. Blais, K.P. Schwarz, M.G. Sideris, N.J. Sneeuw
Digital Imaging Systems
J.A.R. Blais, M.J. Collins, I. Couloigner
GIS and Land Studies
B.A. Ballantyne, N. El-Sheimy, M.E. Rakai, C.V. Tao, C. Valeo
Engineering Metrology
M.P. Tait, W.F. Teskey

Research projects being conducted in the above major research areas are listed in tables on pages 47 - 50.

The number of graduate students working in each area is indicated in Figure 3. It confirms that each of the research areas in the Department is viable in terms of faculty and graduate student involvement and has the depth in human resources to take on major projects.



Graduate Student Distribution by Area

Figure 3

Projects in Positioning, Location and Navigation		
Project Name	**Contract Type**	**Faculty Investigators**
Advanced GPS Rx Analysis	Federal	G. Lachapelle M.E. Cannon R.W. Klukas
Aircraft Buffeting Analysis	Foreign	M.E. Cannon G. Lachapelle
Alberta GPS RTK Test Network	Provincial/Federal	G. Lachapelle
Atmosphere Estimation Using GPS	NSERC Strategic	M.E. Cannon Y. Gao S.H. Skone G. Lachapelle
Auto NCE 21 Collaborative Driving System	Federal Grants	M.E. Cannon G. Lachapelle
Auto NCE 21 Construction-Integrated Navigation Information System	Federal Grants	M.E. Cannon G. Lachapelle
Carrier Phase Based Wide Area Differential GPS	NSERC	Y. Gao
GPS Timing Equipment Testing	Industry	G. Lachapelle
CFI: Developement of an Integrated Technology/Satellite Navigation and GIS	Grants	Y. Gao C.V. Tao
Chair, CRC in Wireless Location/CRC	Federal/NSERC	G. Lachapelle
DFAIT	Federal	G. Lachapelle
Evaluation of Real-Time GPS Positioning	Federal	Y. Gao
GPS/INS for Formula 1 Racing Applications	Industry	N. El-Sheimy
GNSS Centre of Innovation, Feasibility Study	Federal	M.E. Cannon G. Lachapelle
iCore Chair in Wireless Location	Provincial	G. Lachapelle
IIPP - Multi-Sensor Lab	Provincial	N. El-Sheimy M.E. Cannon S.H. Skone G. Lachapelle
Impact of Masking Angle	Federal	S.H. Skone
Ionosphere Modelling	NSERC	S.H. Skone
JPALS Technical Support	Foreign	G. Lachapelle M.E. Cannon
JRAO LAR Positioning	Federal	G. Lachapelle
MEMS Based Inertial Systems for Vehicle	NSERC	N. El-Sheimy Y. Gao G. Lachapelle
Mobile Tracking and Management System	Industry	Y. Gao
Multi Ref ™ Software Enhancements	Industry	M.E. Cannon G. Lachapelle

continued on next page

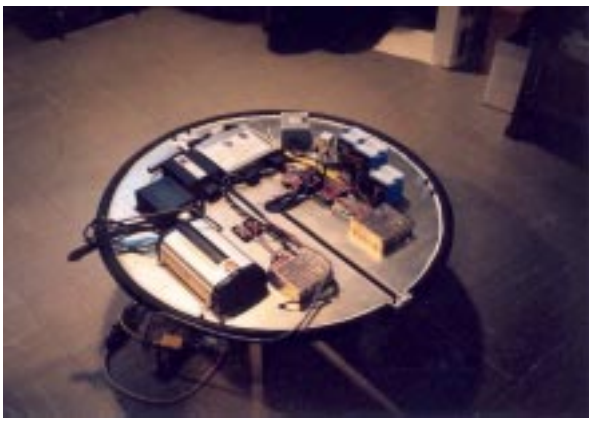
Projects in Positioning, Navigation and Location (Continued)

Project Name	Contract Type	Faculty Investigators
NCE Geoide	NSERC	Y. Gao
Regional Area GPS Kinematic Positioning Using Multiple Reference Stations	NSERC	M.E. Cannon
NSERC UFA	NSERC	S.H. Skone
New Management System/Equip. Utilization	Provincial	Y. Gao
Indoor Wireless Location	Foreign	G. Lachapelle
Precise Kinematic Positioning	NSERC	G. Lachapelle
GPS-based Heading Determination	Foreign	G. Lachapelle M.E. Cannon
REE - Wireless Location	Provincial	G. Lachapelle
RF CDMA Outdoor-Indoor Ranging Investigation	Federal	G. Lachapelle M.E. Cannon R.W. Klukas
REE	Provincial	S.H. Skone
Shipborne Multipath Assessment	Federal	G. Lachapelle
Tactical Indoor Positioning Sytem (TIPS) Options	Federal	G. Lachapelle M.E. Cannon N. El-Sheimy R.W. Klukas
Reliability Testing of DGPS Receivers	Federal	G. Lachapelle
Traffic Accident Reconstruction Using GPS	Provincial	N. El-Sheimy
Validation and Testing of Ionosphere Predictions (Canadian Coast Guard)	Federal	S.H. Skone

Projects in Digital Imaging Systems

Project Name	Contract Type	Faculty Investigators
Integration of Remote Sensing and Physical Process Modelling	NSERC	M.J. Collins
Potentials of Multi-Source Data Fusion	Provincial	I. Couloigner
Remote Sensing Data Synergy	NSERC	M.J. Collins

Projects in Engineering Metrology		
Project Name	**Contract Type**	**Faculty Investigators**
ATCO Electric Deformation Measurement and Analysis	Industry	W.F. Teskey
CFI - Real Time Georeferencing	Federal	N. El-Sheimy
GPS Network Adjustment	Industry	N. El-Sheimy W.F. Teskey
High Precision Industrial Surveys	NSERC	W.F. Teskey
Real-time Network Based GPS Deformation Monitoring	Industry	W.F. Teskey



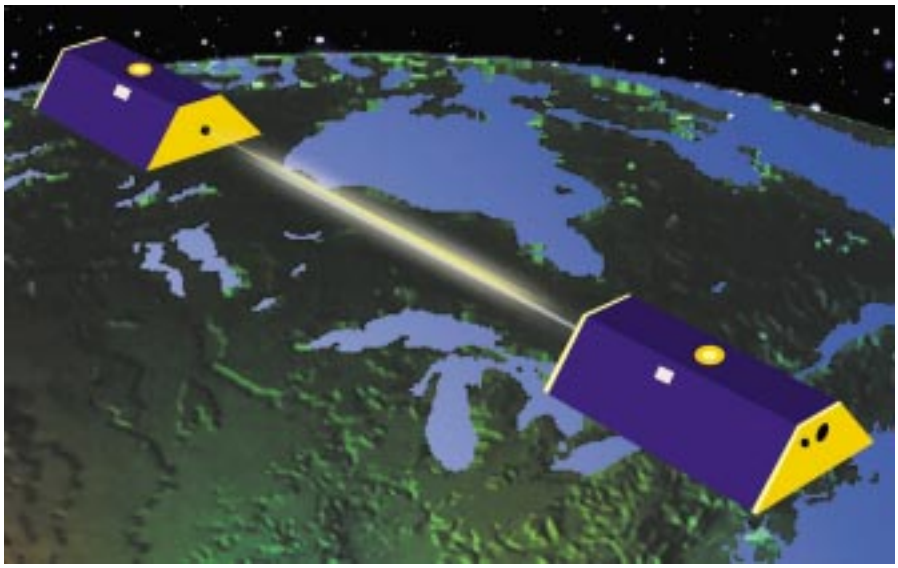
UofC GPS Receiver on the instrument platform of the Large Adaptive Reflector Telescope Prototype at the Dominion Radio Astrophysical Observatory, Penticton, BC (left). This receiver, along with the base station receiver (above) will provide cm-level positioning for the telescope focal point which will be suspended from a blimp 500m above the reflector below.

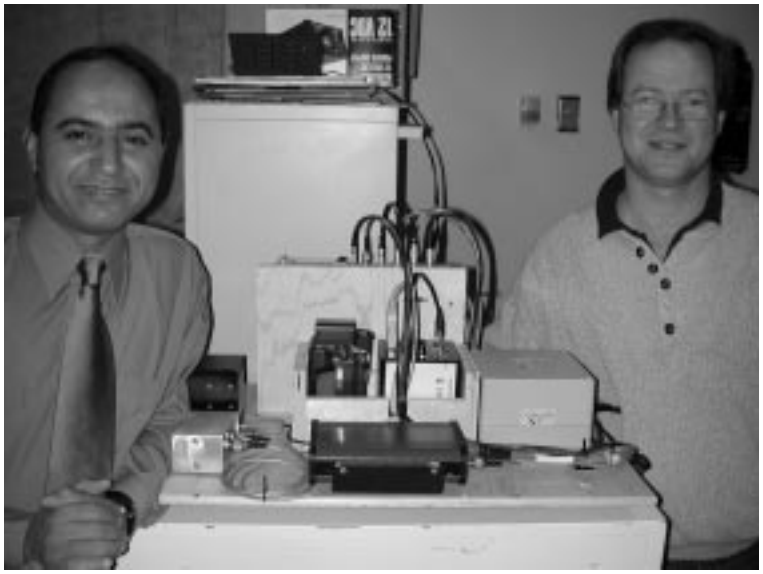
Projects in GIS and Land Tenure		
Project Name	**Contract Type**	**Faculty Investigators**
AOSTAR	Provincial	C.V. Tao
CFI: Devel. of an Integrated Technology/Satellite Navigation and GIS	Grants	Y. Gao C.V. Tao
Development of a PortableMobile Mapping System	Industry	N. El-Sheimy
Internet-Based Geoprocessing of Hybrid Spacial Data	NSERC	C.V. Tao
Legacy 3D Campus	Provincial	C.V. Tao
New Mexico	Foreign	C.V. Tao
REE 00/01	Provincial	C.V. Tao
REE - Environmental and Water Resources Engg	Provincial	C. Valeo
Real-time Airborne Mapping System	NSERC	N. El-Sheimy
Real Time Internet-based Surveillance of Oil/Gas	Provincial	N. El-Sheimy
Real-time Mobile Information Management	NSERC	C.V. Tao
Topographically Dependent Correlation Function	Provincial	C. Valeo
Variable Source-Area Modelling in Mixed Land Use	NSERC	C. Valeo
Young Innovators Award	Provincial	C.V. Tao

Carrie Ho, MSc student of Dr. Caterina Valeo, is conducting field experiments to investigate the spatial and temporal scales of snow and winter ground conditions in urban areas in order to improve environmental modelling in this highly heterogenous environment

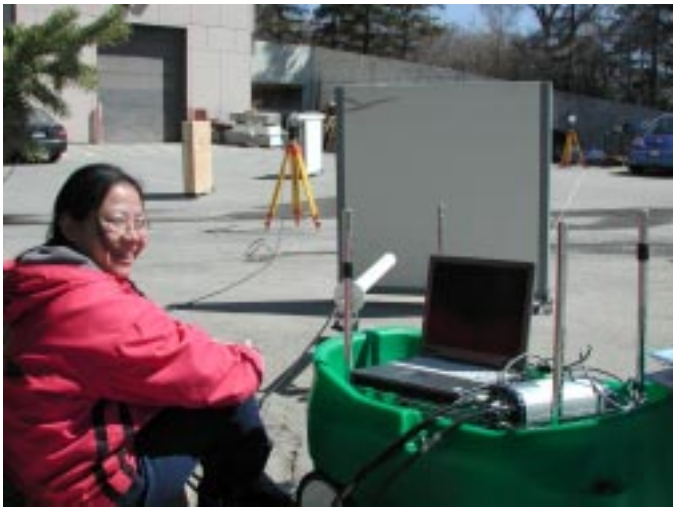
Projects in Gravity Field and Geodynamic		
Project Name	**Contract Type**	**Faculty Investigators**
Airborne Gravity Systems for Geomatics and Geophysics	NSERC	K.P. Schwarz
Gravity Field Determination from 3D High-Low Satellite-to-Satellite Tracking	Provincial	N.J. Sneeuw
GEOIDE NCE - Airborne Gravity for Exploration and Mapping	NSERC	M.G. Sideris K.P. Schwarz
Multiresolution Approximation of the Earth's Gravity Field	NSERC	M.G. Sideris
Precise Geoid Determination for Geo-referencing and Oceanosgraphy	NSERC/Federal	M.G. Sideris
REE - Gravity Field Determination	Provincial	N.J. Sneeuw
GEOIDE NCE - The Synergistic Use of Multi-Sensor Remote Sensing for Monitoring of the Earth's Surface and Atmospheric Parameters	NSERC	M.G. Sideris
Travel Grant, Earth Gravity Workshop, Bern, Switzerland	Provincial	N.J. Sneeuw

The distance between the twin GRACE satellites (a.k.a. Tom and Jerry) is tracked by a radio link. The variation in the intersatellite distance is a sensitive measure of the Earth's gravity field. Gravity field changes over time provide information about phenomena like post-glacial rebound, icecap melting, sea-level rise or basin-wide water budget. Drs. Sneeuw and Sideris are involved in a project that will achieve the next generation vertical reference frame for Canada, taking into account the time-variable gravity field as obtained from gravity missions like GRACE.





Dr. Naser El-Sheimy (left) and graduate student Bruce Wright (right) with a prototype model of the forest fire fighting research project



Graduate student Lei Dong, Test Set Up for RF Propagation Study

Directional Antenna Pointing at MacEwan Student Centre for Indoor Location Tests

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Technology Transfer (New and Ongoing)

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Cannon, M.E., G. Lachapelle and M. Petovello, C^{3}NAVG^2™ - Combined Code and Carrier for NAVigation using GPS and GLONASS, a software package for differential kinematic positioning at the 1-3 m level. Licensed by UTI Inc.
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El-Sheimy, N. and C. Ellum (2001-2002), BUNDLE Software, Bundle is a software package that performs self-calibrating photogrammetric Bundle™ adjustments, terrestrial network adjustments, direct georeferencing using GPS and INS observations. The software has been sold to two universities in Europe, two companies in Canada and one company in Europe since it has been commercialized by UTI (April 2001).
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Geomatics Engineering Theses are now available in their entirety at http://www.geomatics.ucalgary.ca/GradTheses.html

ACADEMIC AND PROFESSIONAL SERVICES

M.E. Cannon

- Member, Gender and Diversity in Engineering Committee
- Member, University Advisory Group (Industry Canada)
- Director, Alberta Research Council
- Member, University Planning Committee
- Member, Minister of NRCan Advisory Board on Earth Sciences
- Member, Alberta Science and Research Authority (ASRA) Board of Management
- Member, University Budget Committee
- Trustee, Alberta Ingenuity Fund
- Director, Top 40 Under 40 Board
- Editorial Board, GPS Solutions

M.J. Collins

- Associate Head Undergraduate Studies
- Member, Faculty of Engineering, Undergraduate Studies Committee
- Member, Teaching Development Committee of the Learning Commons
- Reviewer for three technical journals
- APEGGA, Board of Examiners
- Canadian Remote Sensing Society Certification Board
- Associate Editor, International Journal of Remote Sensing

I. Couloigner

- Member, European Association of Remote-Sensing Laboratories
- Chair, Department Advisory Committee on Geomatics courses for BioEngineering Diploma
- Member, Department Advisory Selection Committee (Photogrammetry position)
- Member, Department Advisory Committee on Space Management
- Member, High School Liaison Committee
- Reviewer, Photogrammetric Engineering and Remote Sensing (PE&RS) Journal
- Member, CFI air quality research committee

N. El-Sheimy

- Chair, International Association of Geodesy (IAG) Special Working Group SC4-WG1 on Mobile Multi-Sensor Systems
- Chair, International Federation of Surveyors (FIG) working group C5.3 on Integrated Positioning, Navigation and Mapping Systems
- Member, Steering Committee of the International Federation of Surveyors (FIG) Commission 5
- Technical Program Co-Chair and Member, Organizing Committee for a number of international conferences on Real-time Mobile Mapping Systems
- Member, International Society of Photogrammetry and Remote Sensing WGII-1 Real-time Mobile Mapping Systems
- Special Examiner, Board of Examiners for Canada Land Surveyors
- Member, Editorial Board of the UK, Survey Review Journal

Y. Gao

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- Member, IAG SSG1.179
- Member, Faculty of Engineering Internship Standing Committee and member of the Internship Advisory Council
- Member, Faculty of Engineering Internationalization Sub-Committee
- Reviewer for Journal of Geodesy and Journal of Geographic Information Sciences
- Department Representatiave, TUCFA
- Special Examiner, Board of Examiners for Canada Land Surveyors
- Editor, Journal of Geographic Information Science

R.W. Klukas

- Department Representative on C-Prosperity Geomatics Cluster Committee
- Department Representative on Faculty of Engineering Undergraduate Studies Committee
- Reviewer for IEEE Transactions on Aerospace and Electronic Systems
- Member of the European Organisation for Civil Aviation Equipment, Working Group 62 on Galileo
- Member of the International Association of Geodesy (IAG), Working Group SC4-1 on Mobile Multi-Sensor Systems
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G. Lachapelle

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- Chair, Institute of Navigation Alberta Chapter
- Member, Institute of Navigation Council
- CCIT Development Team, Faculty of Engineering
- Editorial Board, GPS World
- Editorial Board, GPS Solutions
- Convenor, KIS01 Conference
- Program Chair, ION GPS 2001

M.E. Rakai

- Member, Geomatics Engineering Liaison Committee
- Member, Professional Development Committee, Alberta Land Surveyors Association (ALSA)
- Member, Western Canadian Board of Examiners Committee
- Member, International Federation of Surveyors (FIG) Commission 7 Working Group 7.1: Creating Land Administration in formal and informal environment
- Associate Member, New Zealand Institute of Surveyors

M.G. Sideris

- Reviewer for Geomatica journal
- Associate Dean (Research), Faculty of Engineering
- Associate Head, Graduate Studies, Department of Geomatics Engineering
- Chair, Research and Post Graduate Studies Committee of the Faculty of Engineering
- Member of several committees and forums of the University of Calgary and the Faculty of Graduate Studies
- Member of the Board of Directors of ASTech, the Van Horne Institute, and the Bureau Gravimetrique International

- Member of the Executive Committee of the International Association of Geodesy (IAG)
- President of IAG Section III: Determination of the Gravity Field, and members of several IAG special study groups and commissions
- Chief IAG National Delegate, Canadian National Committee for the IUGG
- Member, Research Management Committee, Geomatics for Informed Decisions (GEOIDE) Network of Centres of Excellence (NCE)

S.H. Skone

- Associate Head, Graduate Studies (from July 1, 2001)
- Research and Post-Graduate Studies Committee
- Lead co-investigator: CHAMP satellite mission
- Chair: Canadian Navigation Society
- Co-Chair IAG SSG 1.180: GPS as an Atmospheric Remote Sensing Tool
- Corresponding member IAG SSG 1.181: Regional Permanent Arrays
- Member, Department Advisory Selection Committees
- Reviewer for numerous international journals

N.J. Sneeuw

- Chair, International Association of Geodesy (IAG) Special Study Group SSG3.185: Merging Data from Dedicated Satellite Missions with Other Gravimetric Data
- Member, International Association of Geodesy (IAG) Special Commission SC-1: Mathematical and Physical Foundations of Geodesy
- Member, IAG/IGGC/IGeS Working Group: Preparation of Standard Procedures for Global Gravity Field Validation
- Member, International Association of Geodesy (IAG), Planning Committee for the Intercommission Committee on Theory
- Member-at-large, Geodesy Section Executive Committee, Canadian Geophysical Union
- Member, High School Liaison Committee
- Member, Gender and Diversity in Engineering Committee
- Reviewer for Journal of Geodesy

M.P. Tait

- APEGGA Essay competition judge
- Vice-Chairman, Calgary CIG Branch
- Departmental Representative, GIAC "Geomatics Leader Forum"
- Departmental Representative, G8 Industry Day
- Member, Remote Sensing and Photogrammetry Society, UK
- Member, Gender and Diversity Committee
- Co-organizer, Geomatics Engineering Industry Day
- Member, Overlap Committee

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- Associate Head, Graduate Studies (to June 30, 2001)
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- Co-Chair, Faculty of Engineering Academic Appeals Committee
- Canadian representative to Commission 6 (Engineering Surveys) of the International Federation of Surveys (FIG)
- Member, Western Canadian Board of Examiners for Land Surveyors
- Academic Examiner for Geomatics Engineering, APEGGA
- Referee from time to time for papers submitted to CIG Journal ACSGC and Journal of Surveying Engineering

C. Valeo

- Member, University of Calgary, Environmental Management Committee
- Member of Canadian Water Resources Association
- Member, Faculty of Engineering, Engineering for the Environment
- Member, Faculty of Engineering Endowment Committee
- Reviewer for Hydrological Processes
- Reviewer for Journal of Air and Waste Management Association
- Member of the Canadian Geophysical Union
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