



Institute for Computing, Information  
& Cognitive Systems  
*Distinguished Lecture Series*

**Managing Massive Interference**  
Helmut Bölcskei, ETH Zurich

Thursday 29 January 330-450pm  
Room 310 Hugh Dempster Pavilion, UBC

The performance of many modern wireless communication systems is limited by interference. Managing this (often massive) interference is one of the major challenges in the evolution of wireless systems. This talk provides an overview of the associated information-theoretic performance limits and discusses several approaches to interference management on the system design level as well as on the signal processing and VLSI implementation levels.

**Speaker:** Helmut Bölcskei is a Professor of Electrical Engineering at ETH Zurich, Switzerland. He received his MS and PhD degrees at Vienna University of Technology, Austria, was a post-doctoral researcher at Stanford University and then joined the faculty of the University of Illinois at Urbana-Champaign.



He received the 2001 IEEE Signal Processing Society Young Author Best Paper Award, the 2006 IEEE Communications Society Leonard G. Abraham Best Paper Award, the ETH "Golden Owl" Teaching Award, and was an Erwin Schrödinger Fellow of the Austrian National Science Foundation. He has been a plenary speaker at several IEEE conferences and serves as an associate editor of the IEEE Transactions on Information Theory. His current research interests are in communication and information theory, signal processing and quantum information processing.

**Info:** 604.822.6894 or info@icics.ubc.ca

**Joint Communications**

**Antenna Efficiency Measurements**

Andrey Gleener, R&D Services Ltd  
Monday 12 January 7pm-9pm  
BCIT SW3 - 1750

Efficiency is a fundamental characteristic of antenna performance. Measurements of antenna efficiency are essential for characterization of low profile and embedded antennas. This presentation discusses different techniques of antenna efficiency measurements and includes practical examples.



**Speaker:** Local R&D practitioner Andrey Gleener is owner of R&D Services Ltd company. Andrey specializes in the development of antennas. He holds several patents and has helped several local product developers with antenna design. "I consider my antenna designs pieces of art similar to sculpting. I want to create as many different ones as I can."

Andrey has ongoing interest in development of low cost methods of antenna characterization and design of innovative low profile antennas.

**Info:** Joint Communications Chair Alon Newton, anewton.ieee@gmail.com

use in the environmental, geotechnical and structural industries.

**Info:** Vancouver IEEE Control Systems Chair: Ryozyo Nagamune, nagamune@mech.ubc.ca

**Control Systems**

**Force Balance Servo Accelerometers From Theory To Practice**

Amirhossein Yousefi  
Weir-Jones Group  
Friday 30 January 1400 - 1500  
Electrical & Computer Engineering  
2332 Main Mall - Kaiser 2020, UBC

The principle of an accelerometer is a proof mass whose position is sensitive to external forces. The sensor responds to input acceleration by deflection of the proof mass through an angle proportional to the input acceleration.



The pickoff and electronics module sense the deflection and convert it into a proportional electrical output signal. By use of negative feedback, the output signal forces a current to flow through torquer coil, causing a restoring torque to be applied to the proof mass. The amount of current that can generate the counterbalancing torque is proportional to the acceleration and therefore becomes the output of the accelerometer. The high-performance accelerometers are normally categorized by different performance specifications including sensor intrinsic noise, short and long term drift, thermal stability, bandwidth, and resolution. These types of accelerometers are generally used for seismic imaging, industrial and structural monitoring, and inertial navigation. From the specification mentioned above, noise and bandwidth are the most challenging. The former is very dependent on the closed loop design of the sensor and overall electronic design including its readout electronics. The latter, depends heavily on the mechanical design and specific features of the sensing element.

The purpose of this talk is to provide an overall understanding of the theory, operation and characteristics of high-performance force balance accelerometers and corresponding practical limitations.

**Speaker:** Amirhossein Yousefi received his Ph.D. in Mechatronics from Technical University of Munich. He works now as control systems designer at Weir-Jones Group in Vancouver. His research fields have been primarily related to model and controller reduction techniques. Most recently, he has been working in the area of designing extreme sensitive force balance accelerometers for



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**THE SECOND UBC/IEEE MINI-SYMPOSIUM ON SATELLITE COMMUNICATIONS**

Friday 09 January 2009  
1230 - 430pm



Organized by:  
UBC Radio Science Lab  
IEEE Joint Communications Chapter

Hosted by:  
MacDonald Dettwiler & Associates  
13800 Commerce Parkway  
Richmond, British Columbia

Sponsored by:  
Western Economic Diversification Canada  
Diversification de l'économie de l'Ouest Canada

Printable Map

**About the event**

In recent years, satellite designers and service providers have begun to exploit the Ka-band (20/30 GHz) as they seek to provide ever higher data rates and capacities at lower cost. Through the efforts of industry, government and academia, Canada has emerged as a leader in this field.

During this afternoon event, presenters from UBC, MacDonald Dettwiler and Associates, Norsat International and Orbital Research will review recent progress in Ka-band satellite communications to both LEO and GEO with particular focus on Ka-band propagation studies, systems engineering, and product development.

**Free Downloads**

- *Handbook of Propagation Effects for Vehicular and Personal Mobile Satellite Systems - Overview of Experimental and Modeling Results* by J. Goldhirsh and W.J. Vogel (348 pp.)
  - *NASA Propagation Effects Handbook for Satellite Systems Design, Fifth Edition*, by L.J. Ippolito (421 pp.)
- Overview Section 1  
Section 2 Section 3

**Registration**

Thanks to generous sponsorship by Western Economic Diversification Canada, registration for this event is free of charge.

Please register by sending your name, company affiliation, and contact information to Prof. Dave Michelson, UBC at davem@ece.ubc.ca.

Because the event is being held in a semi-secure facility, all attendees must register in advance, and no later than the close of business on Tue, 6 Jan 2009.

**Space is limited, so registrations will be accepted on a first-come, first serve basis.**

The meeting time (Friday afternoon) and place (close to BC Ferries, Vancouver Airport, and the US-Canada border) have been chosen to be particularly convenient for visitors from Vancouver Island, the BC Interior, Alberta, and Washington state.

**Agenda**

12:30-13:00	<b>Lunch</b>
13:00-13:05	<b>Welcome and Introduction</b> Michael KW Lee Western Economic Diversification Canada
13:05-13:15	<b>A Brief History of Ka-Band Satellite Communications;</b> Prof. Dave Michelson UBC Radio Science Lab
13:15-13:35	<b>Modelling and Simulation of Rain Fading on Ka-band Links to Low Earth Orbit;</b> Laura W. Liu UBC Radio Science Lab
13:35-13:55	<b>Modelling and Simulation of Scintillation on Ka-band Links to Low Earth Orbit;</b> Prof. Dave Michelson UBC Radio Science Lab
13:55-14:10	<b>Refreshment Break</b>
14:10-14:30	<b>The Ka-band Satellite Beacon Receiving Terminal at UBC;</b> Claire Chuang and Lance Loosdrecht UBC Radio Science Lab (TBA)
14:30-14:50	<b>The Challenges of Ka-band Auto-Acquire Terminals;</b> Michael Scheffer, Director of Engineering Norsat International Inc.
14:50-15:10	<b>Refreshment Break</b>
15:10-15:20	<b>Ten Years of Ka-Band Satellite Communications at MDA;</b> Mark Wlodyka, Director of Business Development, MDA.
15:20-15:40	<b>Ka Band Satellite Communications - A Global Business;</b> Mike Stevens, President Orbital Research Ltd., White Rock, BC
15:40-16:00	<b>Panel Discussion - The Future of Ka-band Satellite Communications Technology</b>
16:00-16:20	Moderator: Dave Michelson, UBC; Mark Wlodyka, MDA; Mike Stevens, Orbital Research; Mike Scheffer, Norsat International
16:20-16:30	<b>Wrap-up</b>