

**Welcome to
Anchorage Alaska
and
IGARSS 2004!**

20-24 September 2004

**William A. Egan Civic
and Convention Center**

and the

Alaska Center for the Performing Arts



Facility Guide

Egan Convention Center

Street Level

Registration and Technical Desk	... Cook Hall
Coffee Breaks (Tues - Thurs)	... Explorers Hall
Interactive Presentations	... Cook Hall
Exhibits	... Explorers Hall
Theatre Pod	... Explorers Hall

Lower Level

Coffee Breaks (Mon & Fri)	... Lower Lobby
Internet Cafe	... Williwaw & Redoubt Rms
Presenters' Prep	... Spurr Room

Technical Sessions

Session 1	... Space 1
Session 2	... Space 2
Session 3	... Space 3
Session 4	... Space 4
Session 5	... Space 5
Session 6	... Space 7
Session 7	... Space 12
Session 8	... Space 13

Performing Arts Center

Plenary Session	... Discovery Theatre
-----------------	-----------------------

Technical Sessions

Session 9	... Sydney Laurence Theatre
Session 10	... Discovery Theatre

Numbers for Receiving Messages On Site

Telephone Message	... 907.277.5512
Facsimile	... 907.277.5503

Cover Image: Photo by and our thanks to Jan Curtis.

Table of Contents

Facility Guide	2
Sponsors	4
Technical Sponsors	4
Exhibitors	4
Travel and Local Information	10
Anchorage International Airport	10
Climate and Weather	10
Currency & Currency Exchange	10
Ground Transportation	10
Language	10
Location	10
Passports and Visas	10
Shopping	10
Hilton Anchorage	11
Anchorage Marriott Downtown	11
Westmark Anchorage	11
Ramada Inn Anchorage Downtown	11
Days Inn Downtown Anchorage	11
Symposium Information	12
Accompanying Person's Pass	12
Badge Distribution	12
Check In	12
Coffee Breaks	12
Exhibits	12
Final Program	12
Internet Cafe	12
Messages	12
On-Site Registration Desk	12
Technical Office	12
Tour Desk	12
Registration Information	13
Cancellation Policy	13
Registration Fees	13
Methods of Payment	13
Publications	14
Conference Proceedings	14
Post-Conference IEEE IGARSS2004 and Previous Year Proceedings	14
TGARS IGARSS 2004 Special Issue	14
Society Membership	14
Social and Technical Tours	16
How to Reserve a Ticket	16
Conference Tours and Events	16
Individually Designed Tours	16
US National Commission of URSI, Commission F, Meeting	21
"Looking for Land Processes Data? ASTER and MODIS" Workshop	21
Tutorials	22
Tutorial 1 — Remote Sensing of Forests: Basics to Applications	22
Tutorial 2 — Urban Applications of Remote Sensing	22
Tutorial 3 — Hyperspectral Image Processing & Analysis	22
Tutorial 4 — Interferometric SAR Principles and Theory	23
Tutorial 5 — Advanced Topics in Interferometric SAR	23
Tutorial 6 — Polarimetric SAR: Techniques, Applications, and the Future	23
Plenary Session	27
Technical Sessions	29

Sponsors and Exhibitors

Sponsors

Institute of Electrical and Electronics Engineers Inc.

IEEE Geoscience and Remote Sensing Society

The Geophysical Institute at the University of Alaska Fairbanks

University of Missouri-Columbia

National Aeronautics and Space Administration (NASA)

National Oceanic and Atmospheric Administration (NOAA)

Office of Naval Research (ONR)

Ball Aerospace & Technologies Corp.

National Polar-Orbiting Operational Environmental Satellite System (NPOESS)

Japan Aerospace Exploration Agency (JAXA)

Raytheon

United States Geological Survey (USGS)

ITT Industries

Technical Sponsors

IEEE Ocean Engineering Society (IEEE OES)

International Union of Radio Science (URSI)

Exhibitors

Advanced Computer Systems

Atlantis Scientific Inc.

Ball Aerospace & Technologies Corp.

Canadian Ice Service

Canadian Space Agency (CSA)

Central Intelligence Agency (CIA)

Geophysical Institute at the University of Alaska Fairbanks

IEEE Geoscience and Remote Sensing Society (IEEE GRSS)

Japan Aerospace Exploration Agency (JAXA)

Korea Aerospace Research Institute (KARI)

Land Remote Sensing Program (USGS)

LISTaR GmbH

NASA Science Mission Directorate

National Polar-Orbiting Operational Environmental Satellite System (NPOESS)

Research Systems Inc.

SeaSpace Corporation

US Geological Survey (USGS)

On behalf of the Geoscience and Remote Sensing Society of the Institute of Electrical and Electronic Engineers, I am pleased to welcome you to IGARSS 2004. As the result of extensive efforts by Professor Verne Kaupp and the IGARSS 2004 organizing committee a broad technical program covering all aspects of remote sensing of the Earth along with a variety of exciting social events has been scheduled. The program of activities is further enriched through co-sponsorship of IGARSS 2004 by the IEEE Ocean Engineering Society. We welcome the participation of our OES colleagues and anticipate many fruitful new areas of collaboration.



Remote sensing has become an invaluable tool for understanding and assessing the state of the Earth, including its oceans, atmosphere, lithosphere, land cover, biota and their many and complex interactions. True to this year's conference theme of "Science for Society," advances in remote sensing to facilitate unique new views of environmental processes that markedly affect life on Earth will be discussed. Such advances in observation technology contribute to a higher standard of living for all humankind, and we are grateful to both our Symposium sponsors and contributors for making their dissemination possible.

Our work as geoscientists and engineers is particularly relevant as we enter an area of global economic interdependence where countries are not only connected environmentally, but are also tightly economically coupled. Environmental perturbations can thus impact the world community both directly and, increasingly, through international economic pathways. Many of our IGARSS sessions reflect this increasing interconnectedness and concomitant need for global cooperation in observing the Earth. In a session on Monday afternoon we highlight IEEE's new and important role in contributing to the Global Earth Observation "System of Systems" through the international Group on Earth Observations (GEO). We look forward to establishing new activities at IGARSS in support of GEO.

This year's Symposium also marks the 10th anniversary of the GRS-S Technical Committees. It seems hard to believe that a decade has passed since the formation of the TCs at the Pasadena IGARSS in 1994. During this time the TCs have grown substantially in both membership and scope. The GRS-S now supports five TCs whose charges collectively span the end-to-end process of remote sensing, that is, from sensor physics to applications of remote sensing, including radio frequency coordination. I invite you to join the TCs during both their special sessions and annual TC dinner.

I wish you an excellent experience during IGARSS week, including the discovery of new friends and your enjoyment of the exquisite Alaskan environs.

Albin Gasiewski
IEEE GRSS President

IEEE GRSS Administrative Committee

Albin J. Gasiewski, *President*

Leung Tsang, *Executive Vice President*

Thomas J. Jackson, *Secretary*

Karen M. St. Germain, *VP for Operations and Finance*

Kamal Sarabandi, *VP for Professional Activities*

Paul Smits, *VP for Technical Activities*

Melba M. Crawford, *VP for Meetings and Symposia*

Jon A. Benediktsson, *Transactions Editor*

Andrew J. Blanchard

William J. Emery, *Letters Editor*

William B. Gail

James A. Gatlin, *Director of Finance*

David G. Goodenough

Martti T. Hallikainen

Ellsworth LeDrew

David M. Le Vine

Charles A. Luther

Anthony K. Milne

Alberto Moreira

Granville E. Paules III

Steven C. Reising

David Weissman

Werner Wiesbeck

Kiyo Tomiyasu

Keith R. Carver

Fawwaz T. Ulaby

Adriano Camps, *GRSS Newsletter Editor*

R. Keith Raney, *GRSS Rep. to Soc. on Social Implications*

Robert A. Shuchman, *Ad Hoc Industry Liaison Committee*

Jay Pearlman, *Ad Hoc Industry Liaison Committee*



--	--

Welcome to Anchorage!

Come! Discover Alaska! From its wildlife to its scenic fjords, swift rivers, glaciers, volcanoes, and mountains, Alaska is the experience of a lifetime; the last frontier. Anchorage is the perfect gateway to explore the vast natural wonders of the last frontier. Nestled between the towering peaks of the Chugach Mountains and the Cook Inlet in south central Alaska, Anchorage is a perfect staging point for personal explorations, and readily available from all parts of the world by air and sea travel. Anchorage is also the perfect venue to provide both the highest quality technical symposium and the most wide-ranging and enjoyable social experience.

The conference accommodations have been carefully selected to provide comfortable lodging covering a large range of costs with easy access to the conference site at the Egan Center in downtown Anchorage. The conference hotel, the Anchorage Hilton, offers quiet comfort, hospitality and convenience. Close to it all, the Hilton is just a short stroll from restaurants, entertainment, shopping, and the Egan Center. Other budgetary needs can be met at other hotels, only slightly farther away.

Tours and social events have been arranged to enhance your Alaskan experience, no matter whether you venture out to commune with Alaska's beautiful, wild wonders or choose to become more intimately acquainted with Anchorage. On a clear day Mt McKinley, at 20,320 feet and just 130 miles (208 km) north of downtown, can be seen. The Aurora Borealis may grace the night sky with her surreal beauty. The golden cloak of the aspens or a hillside covered with fireweed in bloom will take your breath away. Alaska is incredibly colorful. No matter where you go or how you get there, be prepared to be struck by the beauty and wonder of it all.

As tough as it may sound, Team Alaska is working night and day to prepare a technical program worthy of being displayed in such a wonderful, visual environment. *Science for Society: Exploring and Managing a Changing Planet*, this year's theme, is worthy of such a setting. From the opening plenary session to the final papers, the theme and this beautiful setting guide the program flow. In a great circle of science, society supports scientific research, the fruits of research promote applications, applications stimulate commerce, a strong commerce promotes a vigorous society.

Throughout the week an awareness builds of how the citizenry of the Earth benefits from scientific research. As remote sensing continues to mature, it offers critical information for decision support systems serving all parts of society. This unparalleled opportunity is a force for societal benefit to develop a better understanding of the natural forces and processes sculpting our planet to enable sound policy and management decisions.

You are invited to contribute to this exciting vision manifested in a technical program organized under eight headings: Applications of Remote Sensing; Missions and Programs; Geoscience, Modeling and Processes; Data Processing and Algorithms; Electromagnetic Problems; Instrumentation and Techniques; Policy/Societal Issues and Education Initiatives; and special topics in Ocean Engineering. Your participation will continue the tradition of technical excellence, comprehensive coverage of remote sensing, and outstanding IGARS symposia. Plan to attend IGARSS 2004. Share your knowledge with others, and come, experience Alaska.

Verne Kaupp
University of Missouri
General Chairman



Organizing Committee

- † Verne Kaupp, University of Missouri-Columbia
General Chair
- † Craig Dobson, NASA Headquarters
Technical Program Chair
- † Curt Davis, University of Missouri-Columbia
Technical Program Co-Chair
- † Tom Lukowski, Canada Centre for Remote Sensing
Natural Resources Canada
Technical Program Co-Chair
- † Tim Haitcoat, University of Missouri-Columbia
Finance Chair
- † William Emery, University of Colorado
Sponsor/Exhibit Chair
- † Roger Smith, University of Alaska Fairbanks
Geophysical Institute
Alaska Liaison
- † Nettie Labelle-Hamer, University of Alaska
Fairbanks Geophysical Institute
- † Jan Dalrymple, University of Alaska Fairbanks
Geophysical Institute
- † Tammy Stein, *Local Arrangements*
- † Sara Hooper, *Registration/Tours*
- † Jeannie Boyes, *Plenary/Exhibits/Tours*
- † Lisa Ostendorf, *IEEE GRSS Liaison/Exhibitors*

Technical Program Committee

We wish to recognize and thank all the individuals who served on the Technical Program Committee, who through their endless hours of dedication have prepared an outstanding technical program. Without their efforts, IGARSS 2004 would not have been possible.

TECHNICAL CO-CHAIRS

Craig Dobson
Curt Davis
Tom Lukowski

COMMITTEE MEMBERS

Shabeer Ahmed
Thomas L. Ainsworth
Stephen Ambrose
Bill Anderson
Evert Attema
Kultegin Aydin
Richard Bamler
Al Bedard
Jon Atli Benediktsson
Kathleen Bergen
Rajat Bindlish
Andrew Blanchard
Ron Blom
Palma Nicoletta Blonda
Hal J. Bloom
Lori Mann Bruce
Wendy M. Calvin
Adriano Camps
Keith R. Carver
Stan G. Chamberlain
V. Chandrasekar
Kun-Shan Chen
David Clausi
Pablo Clemente-Colon
Don Cline
Leslie M. Collins
Ulisses Confalonieri
Thomas Cooley
Ignasi S. Corbella
Kari J. Craun
Melba M. Crawford
Mihai Datcu
Kirstin M. de Beurs
Fabio Dell'Acqua
David D. Diamond
Hajo Eicken
Paul Eitner
William J. Emery
Rick Forster
Sadao Fujimura
Adrian Fung
Paul D. Gader
William Gail
Paolo Gamba
Rene Garello
Al J. Gasiewski
Gary G. Gimmestad
Sivaprasad Gogineni
David Goodenough
Doug Goodin
Shahid M. Habib
Tim Haithcoat
Dorothy K. Hall
Martti Hallikainen
Geoffrey M. Henebry
Benjamin Holt
Laurence Hubert-Moy
Jason J. Hyon
Eastwood Im
Gail S. Jackson
Thomas J Jackson
Joel T. Johnson
W. Linwood Jones
Josef M. Kellndorfer
John P. Kerekes
Nahid Khazenie
Edward J. Kim
Roger L. King
David B. Kunkee
Venkat Lakshmi
David Landgrebe
Roger H. Lang
Ellsworth LeDrew
Jong-Sen Lee
Sanghoon Lee
Thuy Le Toan
David M. Le Vine
Chuck Luther
Didier Massonnet
Gregoire M. Mercier
Eric Miller
Tony Milne
Noah Misch
Mohamed A. Mohamed
Wooil M. Moon
Alberto Moreira
Zakaria Z. Mouddeh
Son V. Nghiem
Stephen Nichols
K. Olaf Niemann
Eni G. Njoku
Richard B. Olsen
Kevin O'Neill
Peggy E. O'Neill
David Pairman
Kannappan Palaniappan
Simonetta Paloscia
Paolo Pampaloni
Konstantinos Papathanassiou
Granville E. Paules
Jay S. Pearlman
Jeffrey R. Piepmeier
Leland Pierce
William J. Plant
Eric Pottier
Claudio Prati
Paul Racette
R. Keith Raney
Jon Ranson
John A. Reagan
Steven C. Reising
John A. Richards
Helmut Rott
Chris S. Ruf
Vincent V. Salomonson
Kamal Sarabandi
Sebastiano Serpico
Masanobu Shimada
Haruhisa Shimoda
Vern H. Singhroy
James A. Smith
Roger W. Smith
Paul C. Smits
Jean-Claude Souyris
Karen St. Germain
Kiyo Tomiyasu
Ridha Touzi
Leung Tsang
Andres Vina
Steve Volz
David E. Weissman
Ed R. Westwater
H. Peter White
Diane Wickland
Werner Wiesbeck
Helen Wood
Howard Zebker

Welcome to IEEE IGARSS 2004!

These are exciting times to be involved in remote sensing of the earth. We are challenged by frustratingly complex issues such as global change and vexing security issues – both environmental and social. Our knowledge base and toolkits are being radically transformed through accelerating technologic advancement, high bandwidth communications, revolutionary improvements in scientific understanding, and the evolution of modeling environments towards robust forecast capabilities. Our greatest challenge is to capitalize on the advancements and the improved understanding of complex phenomena to provide societal benefit through improved policy and decision support systems.

Engineers and scientists of the IEEE Geoscience and Remote Sensing Society occupy a unique position to achieve the goal of *Science for Society: Exploring and Managing a Changing Planet*. This is not just the title of IGARSS'04, it is an underlying theme for organization of the conference. The technical program committee (TPC) has channeled the creative energy of 140 members towards producing an exciting technical program that embraces the traditional broad spectrum of GRSS interests and those of the IEEE Ocean Engineering Society within the contextual framework of *Science for Society*. The TPC received more than 2,300 abstracts, a rich set of ingredients from which to assemble an intellectual feast.

Your active participation as both presenters and attendees ensures achievement of the objective to communicate recent advancements in theory, instrumentation, techniques, scientific understanding, missions, and applications. An exciting plenary program on Monday morning has been structured around the meeting theme and flows into a program of coordinated oral and interactive sessions that further explores these and other topics throughout the remainder of the week. Those of you who are regular IGARSS attendees will feel right at home. Traditional program elements are thoroughly covered with sessions (oral/interactive) organized within broad thematic areas: atmosphere (4/3), ocean (9/8), cryosphere (5/4), geology and hydrology (6/8), ecology and land cover (9/18), applications (12/5), education and policy (2/2), electromagnetics (2/4), missions (11/8), instrumentation and techniques (2/2), optical techniques (6/7), microwave techniques (9/8), and processing and analysis methods (15/18). In addition, there are sessions for the GRSS Technical Committees and an excellent set of tutorials being taught by leading experts in a variety of areas (hyperspectral, radar polarimetry, urban applications, etc.).

You will also notice some changes intended to enhance the communication experience. Attendee profiles and demographics have been used to apportion the technical program amongst the theme and topic areas, to organize the schedule such that there is always one or more sessions of interest to attend, and to minimize schedule conflicts to the extent possible. For example, the interactive sessions are scheduled to complement the associated oral sessions usually on the same day in an AM/PM format. Importantly, we have tried to enhance the interactive sessions by providing greater accessibility to papers and support for use of electronic presentation in addition to posters.

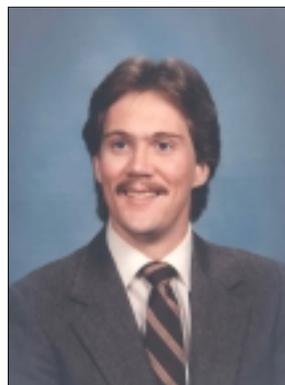
While at IGARSS be sure to take advantage of the technical tours that both complement the technical program and provide exhilarating opportunities to experience the adventure that is Alaska. Welcome to IGARSS'04. Relax. Communicate. Enjoy.

IGARSS 2004 Technical Co-Chairs

Craig Dobson
NASA



Curt Davis
University of Missouri-Columbia



Tom Lukowski
Canada Centre for Remote Sensing
Natural Resources Canada



Travel and Local Information

Anchorage International Airport

Located a 15-minute drive from downtown, the Anchorage International Airport is serviced directly from transportation hubs in North America, Japan, Korea and Europe. Following is a sampling of nonstop flight times:

UNITED STATES	
Seattle	3:00
Los Angeles	5:00
Chicago	5:45
New York	7:30
Washington DC	8:45
ASIA / PACIFIC RIM	
Seoul Korea	8:00
EUROPE	
Frankfurt Germany	9:00 *

*Condor Airlines, operated by Thomas Cook, is the only airline to service Anchorage from Europe over the Pole, cutting travel time significantly. Flights are limited.

Alaska Airlines is offering special fares on Alaska/Horizon Airline flights to Anchorage connecting from Alaska Airlines destinations, and on flights with American Airlines from codeshare departure cities. For more details or to make airline reservations, you or your travel agent must contact the Alaska Airline Group Department at 1.800.445.4435 (the event name is IEEE GEOSCIENCE/REMOTE SENSING INTERNATIONAL SYMPOSIUM).

Climate and Weather

Anchorage is the largest city in Alaska with a population of 254,000. The community covers nearly 2,000 square miles, containing 500,000 acres of preserved parkland and miles of some of Alaska's most spectacular wilderness. Anchorage is framed on the north by Mt. McKinley and the agriculturally-rich Matanuska-Susitna Valley; on the south by the Kenai Peninsula; on the east by Prince William Sound; and on the west by Cook Inlet and the great Alaska Range. During the conference dates, participants will experience the brief autumn season of Alaska, providing abundant color with perhaps a light snowfall on the surrounding mountain peaks. The average high temperature for September is 55°F/13°C with 14:30 hours of functional daylight.

Currency & Currency Exchange

The unit of currency is the US dollar divided into 100 pennies. Travelers' checks are honored at most banks, hotels and shops. Major credit cards are also widely accepted. Currency exchange rates are posted at most hotel front desks, and all port of entry airports offer currency exchange facilities.

Ground Transportation

The Anchorage International Airport is a 15-minute drive from downtown hotels. Ground services include airport limo, taxi (\$17.00), Super Shuttle (\$11.00), and many car/van rental agencies. AVIS Rent a Car of Alaska is offering all IGARSS 2004 attendees a special rate on all their vehicles, starting at \$35.00 daily or \$210.00 per week. To reserve a car, visit the AVIS website at www.avisalaska.com and use booking code W027400 when making your reservation.

Language

The official language of the Symposium is English.

Location

Anchorage is as far north as Helsinki, Finland, and as far west as Honolulu, Hawaii. Alaska has its own time zone, known as AST or ADT. In September, Alaska is 4 hours behind the Eastern time zone in the United States and 8 hours behind GMT.

Passports and Visas

Visa applications are currently subject to a greater degree of scrutiny than in the past. Many applicants may be required to appear in person for an interview as part of the visa process. Attendees should apply no later than 3 months prior to the conference. Additionally persons visiting the United States should be aware that the US federal government has initiated a new identification program, US-VISIT, to expedite the entry process and to provide greater security. Upon arrival at customs, visitors (except those citizens from the 27 countries listed under the visa waiver program) must press their index fingers against a computer scanner and have their photo taken. Users of the system to date have indicated that the process went quickly and smoothly, with no lines and delays. Travelers with passports from the following countries will not be subjected to the new fingerprint and photo tracking system:

Andorra	Iceland	Norway
Australia	Ireland	Portugal
Austria	Italy	San Marino
Belgium	Japan	Singapore
Brunei	Liechtenstein	Slovenia
Denmark	Luxembourg	Spain
Finland	Monaco	Sweden
France	New Zealand	Switzerland
Germany	The Netherlands	United Kingdom

Additional information may be found on the US Department of State, Bureau of Consular Affairs visa services website at http://travel.state.gov/visa_services.html.

Shopping

Shops are open during the week, Monday through Saturday, 10:00am to 19:00, and Sunday, 12:00 - 18:00.

Accommodations

Room blocks at discounted group rates have been secured throughout Anchorage for IGARSS 2004 guests. Unfortunately, due to the beginning of the academic session, dorm rooms are unavailable for conference use. For those who need to reduce their housing cost, we encourage you to share a room with a colleague, dividing the per night room cost. If needing a room with two beds, you should request a double double (or two double beds) when making your reservation.

Individuals are required to make their own reservations by contacting the reservation numbers provided for each hotel. All rooms remaining unsold as of 18 August 2004 will revert back to hotel inventory at which time they may be reserved, if available, at the then-current published rate.

Deluxe Hotel (HOST)

Hilton Anchorage

500 West Third Avenue

Group Rate: US\$ 130.00 per night single or double
Reservations: 1.800.245.2527 or 1.907.272.7411
fax 1.907.265.7042 ATTN: Erin Dreyer

Website: www.anchorage.hilton.com

Group Name: IEEE Geoscience & Remote Sensing Society

Conveniently located in the heart of the city and only 210 steps from the Egan Convention Center, the Hilton Anchorage offers a unique combination of warm Alaskan hospitality, friendly service and incredible views. The Anchorage Hilton has been selected as the conference host hotel. It will serve as the location for many conference events and will be the departure point for all pre- and post-conference as well as some mid-week social tours.



Each guest room is appointed with a coffee maker, large work desk, two dual-line phones with voice mail and data ports, iron and ironing board. Newly remodeled, guests have the option of dining in the cafe-style lobby dining facility or the elegant Top of the World restaurant located on the top floor, or meeting with colleagues for drinks in Bruins Bar located on the lobby level. Other services include the convenience of Starbucks and Kinkos in the main lobby, 24-hour room service, an indoor swimming pool, massage service, whirlpool and fitness center with steam room.

Moderate Hotel

Anchorage Marriott Downtown

820 West 7th Avenue

Group Rate: US\$ 99.00 per night single or double
Reservations: 1.800.228.9290 or 1.907.792.2108
fax: 1.907.279.8005

Website: www.marriott.com/ancdt

Group Name: IEEE

Budget Hotels

Westmark Anchorage

720 West 5th Avenue

Group Rate: US\$ 73.00 per night single or double
Reservations: 1.800.544.0970 or 1.907.276.7676
fax 1.206.301.5247

Website: www.westmarkhotels.com

Group Name: IEEE Geoscience & Remote Sensing Society or IGARSS 2004

Ramada Inn Anchorage Downtown

115 East 3rd Avenue

Group Rate: US\$ 59.00 per night single or double
Reservations: 1.866.726.2327 or 1.907.272.7561
or fax 1.907.272.3879

Website: www.the.ramada.com/anchorage14614

Group Name: IEEE

Days Inn Downtown Anchorage

321 E 5th Avenue

Group Rate: US\$69.00 per night single or double
Reservations: 1.907.265.5139 or fax 1.907.265.5164
or email at daysinn@alaska.com

Website: www.daysinnalaska.com

Group Name: IEEE

***All room blocks expire
18 August 2004!
Reservations should be made prior to
this date to guarantee a room at the
best conference rate.***



Symposium Information

Accompanying Person's Pass

Persons accompanying a conference attendee may register to receive an AP Pass. The AP Pass includes entrance to the opening reception at the Anchorage Museum of History and Art, an exclusive Anchorage Tour for pass holders only (refer to page 17), and access to the conference exhibit and break areas. Persons participating in the technical sessions are not eligible to receive an AP Pass.

To register for an AP Pass, visit the conference website at www.igarss04.org, select SOCIAL PROGRAMS/TOURS from the main menu, then select Alaskan Destinations. Complete the reservation form and submit with payment as directed.

Badge Distribution

Your name badge, which must be worn at all times while in the conference area or at conference-sponsored events, will be included in the registration packet given to all registered guests. Access will be prohibited to the exhibit, break, interactive areas, and technical sessions if a name badge is not visible. A small fee and proof of registration must be provided to obtain a replacement badge.

Check In

All attendees are required to check in at the Registration Desk in the Egan Convention Center, Cook Hall (street level). Each registered participant will receive a name badge, DVD Proceedings (one copy), final program, and receipt of all payments made. The online registration system will close at 5:00pm EDT on 03 September 2004. All registrations received after this time will be considered on-site registrations. Persons registering on-site should check-in using the ON-SITE REGISTRATION queue.

Coffee Breaks

Coffee breaks will be held at 10:00 - 10:20 each morning and at 15:20 - 15:40 each afternoon at the following locations —

Monday morning

... Performing Arts Center, Discovery Theatre Lobby, and Egan Convention Center, Lower Level Lobby

Monday afternoon and all day Friday

... Egan Convention Center Lower Lobby

Tuesday through Thursday

... Egan Convention Center, Explorer's Hall (street level).

Exhibits

The IEEE IGARSS 2004 Exhibit Showcase will be open Tuesday, September 21, from 10:00 to 19:00, and Wednesday and Thursday, September 22-23, from 10:00 to 16:00. Guests are invited to enjoy beverages and light hors d'oeuvres while visiting with commercial vendors at the Exhibition Opening Reception, Tuesday, September 21, from 17:30 - 19:00.

Final Program

One (1) printed hardcopy of the final program will be included in each registration packet. Additional copies may be purchased, if available, for US\$10.00 with proof of registration.

Internet Cafe

Internet access will be available to all registrants via the Internet Cafe located in the Williwaw and Redoubt Rooms (Egan Center lower level) from 08:00 to 22:00 daily except for Friday when the Cafe will close at 16:00.

Messages

Participants may receive telephone messages at the convention site via the following numbers ...

telephone	... 907.277.5512
facsimile	... 907.277.5503

On-Site Registration Desk

The Registration Desk in the Egan Convention Center, Cook Hall (street level), will be open at the following times to assist you and your guests with registration and information throughout the symposium.

Sunday	September 19	07:30 - 17:00
Monday / Tuesday	September 20 & 21	07:30 - 18:00
Wednesday / Thursday	September 22 & 23	08:00 - 18:00
Friday	September 24	08:00 - 16:00

Technical Office

The Symposium Technical Desk, located in Cook Hall (street level), will offer the following services:

- receive and send faxes
- receive telephone messages
- make copies of documents
- obtain answers to technical program questions
- baggage storage.

The Technical Office will be open Monday through Friday, September 20-24, from 09:00 - 13:00 and 14:30 - 18:00.

Tour Desk

Logistics, one of two tour agencies supporting IGARSS 2004, will host a tour desk on site to assist conference guests with arranging day trips and to answer questions about the local area. *Logistics cannot assist with pre-arranged tours made through Alaska Destinations; guests with reservations in these tours should inquire at the Registration Counter/On-Site Registration area.*

Registration Information

Cancellation Policy

If you must cancel your registration, the following penalties will apply (published authors will be charged the Program Fee in addition to the following):

Before and including 03 September 2004 ...
Full refund less \$50.00 processing fee.

04 September 2004 and after ...
No refunds will be given.

For registration information, contact: hooper04@verizon.net .

Registration Fees

Participant registration fees include admission to the conference sessions, exhibit and break areas, welcoming and exhibition opening receptions, and one (1) copy of the Symposium Proceedings on DVD. To take advantage of lower registration rates, a completed registration form and payment must be received by 23 July 2004.

Registration Category	Before or On 23 July	After 23 July
IEEE Member ¹	\$ 625.00	\$ 725.00
Non-Member	\$ 780.00	\$ 880.00
Student/Retired ²	\$ 190.00	\$ 290.00
One Day Pass	\$ 440.00	\$ 440.00

¹) IEEE Members are individuals who have joined the IEEE by completing an application and remitting the appropriate fees. Canadian Remote Sensing Society (CRSS) members may register under member fees.

²) Proof of status should be provided by students by sending a photocopy of their student card.

Methods of Payment

Payment must accompany your registration and may be made via credit card, check or purchase order. All payments must be made in US dollars.

Credit Card — Persons paying with a credit card may register online. American Express, Mastercard/Eurocard and Visa will be accepted. Please note that if your credit card is declined or is invalid, an alternate means of payment must be used to remit fees.

Check or Purchase Order* — If remitting by check or purchase order, participants should download the registration form from the conference website, complete and return with payment as follows. Checks should be made payable to IEEE IGARSS 2004.

IEEE Conference Services
445 Hoes Lane
PO Box 1331
Piscataway NJ 08854 USA

FAX: 1.732.465.6447

*If payment is remitted via purchase order, a copy of the purchase order must accompany the registration form and be received by 23 July 2004 to qualify for early registration rates.

To register:

online through 09/03/04 at
www.igarss04.org — select REGISTRATION

via fax through 09/03/04 to 732.465.6447
download a registration form from www.igarss04.org

onsite at the registration desk (Cook Hall)



Publications and Membership

Publications

Conference Proceedings

Delegates will receive as part of their registration fee, the *IGARSS 2004 Proceedings* on DVD. Additional DVD proceedings may be purchased in advance via the registration form or on-site at the Registration Counter for US\$35.00 respectively while supplies last.

Post-Conference IEEE IGARSS2004 and Previous Year Proceedings

Following the Symposium, copies of the *IGARSS 2004 Proceedings* may be purchased from IEEE directly:

IEEE Single Copy Sales
445 Hoes Lane
Piscataway NJ 08855-1331 USA
tel: 732.981.0060 fax: 732.981.9667

TGARS IGARSS 2004 Special Issue

IGARSS 2004 presenters are invited to submit manuscripts no later than 01 November 2004 for possible publication in the *IEEE Transactions on Geoscience and Remote Sensing IGARSS 2004 Special Issue* to be published November 2005. Submissions should be complete descriptions of new and significant results. In most cases, the conference paper as printed in the symposium proceedings will not be suitable for submission to the *Transactions*. Papers published but not presented will not be considered.

Manuscripts should be prepared according to the instructions listed on the inside back cover of any recent *Transactions* issue. Papers will be reviewed in the standard IEEE process.

Authors are strongly encouraged to submit electronically using the TGARS submission website: <http://www.ieee.org/tgrs/emanuscript>. Alternate submissions means may cause a delay in the processing of the manuscript. Authors who are unable to create electronic files should send five (5) hard copies of the manuscript to:

TGARS Manuscript Review Assistant
Transactions on Geoscience and Remote Sensing
IGARSS 2003 Special Issue
IEEE Periodicals
445 Hoes Lane
Piscataway NJ 08855 USA

All questions regarding manuscript submission should be directed to oprsadmin@ieee.org.

Membership

Why should you join the IEEE Geoscience and Remote Sensing Society?

- Keep updated in your area of expertise.

The *Transactions on Geoscience and Remote Sensing*, the Society's premier technical journal, is published monthly. The "GRSS Newsletter," published quarterly, is also an effective interface between the Society and the membership.

- Have access to the latest on-line technical information.

Using IEEE Xplore you can access the IEEE table of contents, abstracts, indexes full manuscripts of the *Transactions on Geoscience and Remote Sensing* and now the proceedings of the IGARSS conference in citable format.

- Exchange information with colleagues.

Gather with colleagues in your area of expertise at the annual IGARS symposium and other GRSS-sponsored workshops/conferences at a reduced rate. Network with colleagues where you live and work through local chapter activities and technical committees.

Membership Options

To receive the full range of benefits from the Geoscience and Remote Sensing Society (GRSS), consider joining as a full IEEE member or an affiliate member. As a full IEEE member, you receive an extensive benefits package in addition to the GRSS membership. Affiliate members become members of just the GRSS and receive full society benefits —perfect for professionals whose broad technical interests are in areas other than those of the IEEE.

Become a GRSS member for free if you attend IGARSS 2004 ...

You can get a full year's membership in IEEE GRSS free if you join at the conference! Special applications for this promotion will be accepted at the IEEE GRSS booth at IGARSS 2004. This offer is limited to first-time, full members of IEEE and GRSS who are officially registered for the conference and paid a non-member registration fee. This offer does not apply to students, due to the already low rates and benefits offered to IEEE GRSS student members. The number of free one-year IEEE memberships is limited to the first 100 approved applications. Please see an IEEE GRSS representative at the GRSS booth when the exhibition opens for more details.

To learn more about the different memberships, visit the Society web site <http://ewh.ieee.org/soc/grss/> and click on "Join Us."

IEEE GRSS Technical Committees

In 1994, three IEEE GRSS technical committees were established to influence the Society's strategic goals. The number has since expanded to five including: (1) Data Archiving and Distribution (DAD), (2) Data Fusion (DF), (3) Frequency Allocations in Remote Sensing Committee (FARS), (4) Instrumentation/Future Technologies (IFT), and (5) User Applications in Remote Sensing (UARS) Technical Committees. Conference participants are invited to attend the IEEE GRSS Technical Committee dinner (Tuesday evening, 21 September, to meet with Society members and Chapter Chairpersons to discuss the status of IEEE GRSS Technical Committees and local chapters. Tickets may be purchased in advance via the social program reservation form, or on-site at the registration desk.

Descriptions of each Technical Committee are provided as follows for your immediate reference.

Data Archiving and Distribution Committee

Roger King, Mississippi State University_committee chair
Liping Di, George Mason University_co-chair

The mission of the Data Archiving and Distribution Technical Committee is "to provide recommendations and responses to issues related to the archival and distribution of remotely sensed geospatial and geotemporal data, and on how new media, transmission means, and networks will impact the archival, distribution, and format of remotely sensed data." The Technical Committee is also developing a research agenda for this emphasis area to study the impact of media, channel, and network scaling on the archival and distribution of data.

Corresponding Technical Session:
Friday morning, 24 September, Interactive Session;
and Friday afternoon, Session 6.

Data Fusion Technical Committee

Lori Bruce, Mississippi State University_chair
Palma Blonda, CNR-IESI, Italy, co-chair

The goal of data fusion is to develop improved remotely sensed information by amalgamating data from distinct sources, for example, from sensors using different spectral bands, spatial responses, and/or detection principles. Data fusion comprises issues ranging from registration and pixel-level fusion of data for improving the spatial resolution of imagery to decision level fusion by using previously computed information stored in Geographic Information Systems (GIS). The charge to the DF TC is to serve as a global, multidisciplinary, network for geospatial data fusion, connecting people and resources. The DF TC aims at educating students and professionals, and at promoting best practices in data fusion applications.

Corresponding Technical Session:
Monday afternoon, 20 September, Session 4;
Tuesday morning, 21 September, Session 5;
and Tuesday afternoon, Interactive Session.

Instrumentation & Future Technologies Committee

Jeffrey Piepmeier, NASA Goddard Space Flight Center_chair
John P. Kerekes, MIT Lincoln Laboratory, co-chair

The IFT TC serves as a conduit for information on new technology development in remote sensing. Its charge is to promote the dissemination of technical information related to new remote sensing instrumentation and related technologies.

Corresponding Technical Session:
Tuesday afternoon, 21 September, Session 8.

Frequency Allocations in Remote Sensing Committee

David Kunke, The Aerospace Corp_chair
David Deboer, SETI Institute_co-chair

The IEEE GRS-S Technical Committee on Frequency Allocations in Remote Sensing (FARS) provides technical assessments, guidance and recommendations regarding matters of frequency sharing and interference between remote sensing and other uses of the radiowave spectrum. The need for strong participation by the research committee in this area of policy has become increasingly important as more and more commercial interests move their frequencies of operation up into the microwave region that we are dependant on. FARS invites all interested individuals to attend our related special session to learn more about the interference problem and potential mitigation strategies. In addition, anyone considering getting involved with FARS is encouraged to join us during the Technical Committees' Luncheon. To learn more, visit us at <http://www.fars-grss.org> or contact us via email [Christopher S. Ruf (cruf@umich.edu); Ram Narayanan (rnarayanan@unl.edu)].

Corresponding Technical Session:
Thursday afternoon, 23 September, Session 6.

User Applications in Remote Sensing Technical Committee

Ellsworth LeDrew, University of Waterloo_chair
Venkat Lakshmi, University of South Carolina_co-chair

Satellite and other remotely sensed data have had a major impact on the face of science, industry, and policy. The charge of the UARS TC is to support the development of remote sensing applications within the broad communities of users in earth and planetary science. Possible themes areas for the committee reflect new challenges in how the GRS-S can contribute to these constituent communities. These areas include: 1) integration of remotely sensed data with other data types for improving the accuracy of derived geophysical parameters, 2) data mining of multidimensional data archives of various types and structures for use in scientific applications, 3) regional and global environmental model development, including models incorporating feedback from multiple ecosystems processes at several spatial and temporal scales, and 4) wideband distributed analysis techniques for remote sensing applications.

Tours and Events

Social and Technical Tours

A full schedule of social and technical tours are being offered to IGARSS 2004 participants and their guests. From pre- to post-conference, you can enjoy the Alaskan experience. In addition, technical tours have been arranged to provide an indepth look at Alaska and its unique environment. All social and technical tours are open to any registered participant or accompanying person.

How to Reserve a Ticket

To assist you in reserving a place or ticket for your preferred events, an abbreviation follows each event description. To participate in an organized tour or event ...

- Conference Tours & Events

Pre-advertised tours are now closed to additional reservations. If you have pre-purchased a ticket(s), the ticket(s) will be in your registration envelope. Tickets remain for the following events and may be purchased at the Registration Desk ...

Accompany Persons Pass
Earthquake Park Technical Tour
IEEE GRSS Technical Committees Dinner
IEEE GRSS Awards Banquet

- Individually Designed Tours

Logistics will be serving an on-site tour desk to assist you with booking and/or planning individualized tours.

Accompanying Person Pass

Available to any person accompanying a conference delegate. Permits access to the welcoming reception at the Anchorage Museum of History and Art (Sunday evening), participation in the Anchorage Historical Walking Tour and fur show (Monday afternoon), exhibit opening reception (Tuesday afternoon), exhibit hall and coffee break stations (all week). Only available to persons accompanying a conference delegate. Does not give access to plenary or technical sessions. Price Per Person: \$60.00

Saturday, September 18

09:00 - 17:00

Sea Kayaking in Prince William Sound (guided tour) — CLOSED

Guests will travel by mini coach along the Turnagain Arm and through two separate tunnels, one and two miles long respectively, through the Chugiak Mountain Range to the Port of Whittier. The kayaking adventure will begin with an orientation on the kayaks, and basic instruction on kayaking within the harbor. A guide will lead the group across the canal from Whittier to the busy hangout for the Black-Legged Kittiwake sea bird. A light lunch will be provided along the way. Participants will continue to enjoy hidden coves, waterfalls and glacial views of the Sound as you paddle your way back to Whittier. This peaceful mode of travel is an intimate way to experience the pristine wonders of this remote and beautiful part of Alaska. This is a good trip for those wanting an introduction to sea kayaking, moderate exercise and a real Alaskan adventure. Dress: Participants should dress in layers, conditions can be 45 degrees rainy or 75 degrees sunny. Bring an extra set of dry clothing and a hat. Price Per Person: \$162.00



All tours will depart from the Egan Convention Center unless otherwise stated.

Tours and Events

Sunday, September 19

08:30 - 16:30

Glacier Technical Tour — CLOSED

Why are Alaska's glaciers melting faster than anywhere else?

Here is a hike for the adventurer! Fifty miles south of Anchorage, one will experience Portage Valley, Portage Glacier and Byron Glacier. View how living glaciers continue to carve the landscape and shape the life of the Chugach National Forest. Participants will have the opportunity for an up-close encounter with Byron Glacier and enjoy great mountain scenery. The trail to Byron Glacier is well-maintained and wide during the first half, with the second half being rocky with small stream crossings. The trail ends below Byron Glacier. Additionally, participants will have the opportunity to visit the Begich-Boggs Visitor Center and enjoy an in-depth lecture with one of our Emeritus Professors on the retreat of Portage Glacier and the decline of Alaska's glaciers in general. Casually take a walk on the boardwalk and see first hand the remnants left by Portage Glacier. **Dress:** Participants should dress in layers; conditions can range from 45 degrees and rainy to 75 degrees and sunny. **NOTE this HIKE is for the MODERATE HIKER due to unstable gravel at times. Bring hiking boots, appropriate walking gear, and a small backpack. Be prepared to walk through small streams. A change of socks is recommended.** Price per person: \$115.00

08:30 - 15:30

Portage Glacier Cruise & Girdwood Valley Tour — CLOSED

Guests will depart Anchorage heading south on the Seward Highway along the Turnagain Arm of Cook Inlet. With the Chugach Mountain Range on one side of the highway and the Cook Inlet on the other, the Alaska Range across the inlet, and the Kenai Range in front of the coach, the scenery along this stretch of highway is nothing short of spectacular. Guests will want to keep their eyes alert for beluga whales in the inlet, Dall sheep on the mountainsides, and moose in fields or near ponds. The bald eagle is also a frequent sight along this stretch of road.

On arrival at Portage, guests will tour the Begich-Boggs Visitors Center, where they will have the opportunity to view the award winning film "Voices from the Ice." As the film ends, the screen rises, and drapes open to a huge picture window overlooking Portage Lake. Participants will re-board the motorcoaches for the short transfer around the lake to board the IGARSS-chartered MV Ptarmigan boat for the 1.5 hour round trip to the face of Portage Glacier. After Portage, the coaches will travel down the scenic by-way to the ski resort town of Girdwood and the Alyeska Prince Resort. Mount Alyeska served as the training ground for Tommy Moe, the US Downhill Gold Medallist in the 1994 Olympics. Guests will take the 60-person tram to the top of the mountain, where they

will enjoy lunch at the Glacier Express casual restaurant. There will be a stop at the Jade Shop in Alyeska where the owners have accumulated an incredible collection of Alaskan artifacts over their many years in Alaska. Guests may view and purchase jade carvings, jewelry, and native artwork in the shop. Price per person: \$119.00

18:00 - 19:30

Opening Reception

Anchorage Museum of History & Art — TICKETS AVAILABLE

You are invited to join us at the IGARSS 2004 Opening Reception to welcome colleagues and to honor the 2004 PECORA Award recipient, Thomas Jackson. The Anchorage Museum of History and Art offers the opportunity to see splendid objects from Alaska's exciting past and present while engaging in conversation with colleagues and conference guests. The largest museum in the state, the Anchorage Museum contains over 93,000 square feet of space. The Alaska Gallery depicts the history of Alaska to the present. Miniature dioramas show Native subsistence lifestyles prior to European contact. Collections of Aleut, Eskimo, Tlingit, Haida and Athapaskan materials portray themes such as housing, clothing, transportation and celebrations. Art of the Far North galleries include works of art by a diverse group of artists who have drawn and painted the landscape and people of the Far North since the time of the early European and American explorers to the present, including a gallery with works of Sydney Laurence, Alaska's best known painter. All of the museum's galleries will be open to conference attendees. Light hors d'oeuvres and drinks will be served. Guests are on their own to arrive at the reception, located downtown at 121 West Seventh Avenue. Price per person: Complimentary with full registration or AP pass; additional ticket: US\$25.00

Monday, September 20

13:30 - 17:00

Accompanying Person Anchorage Tour (with AP Pass only)

Hilton Anchorage Hotel, Aspen Room

Participants will meet at the Anchorage Hilton for a welcome coffee to include an assortment of desserts and fresh fruit. Guests will learn about the history of Anchorage as it grew from a tent city to the largest city in Alaska. After the presentation, participants will be led on a two-hour walking tour of Anchorage lead by a Historic Anchorage Properties docent. The final stop will be at David Green's Master Furrier Showroom where guests will learn about the fur trade in Alaska and be given the opportunity to try on various furs. Depart from and return to the Anchorage Hilton.

Tours and Events

Tuesday, September 21

09:00 - 12:00

Earthquake Park Technical Tour

Hilton Hotel, Willow Room

— TICKETS AVAILABLE

Did you feel that? 50% of all earthquakes that happen in the US are located in Alaska! The second largest earthquake of the 20th century and the largest ever recorded in the northern hemisphere, occurred in Alaska on March 27, 1964 (3/27/64 05:36:14.0 p.m., local time; 3/28/64 03:36:14.0 GMT). The earthquake had a magnitude 9.2 (Moment Magnitude) and caused extensive damage in Alaska. Local tsunami waves triggered by this earthquake were extremely destructive in Prince William Sound and other areas of Alaska. You are invited to join a once in a lifetime opportunity to experience the damaging effects of an earthquake. Join us as we venture from classroom to field (Earthquake Park), highlighting the history of the 1964 QUAKE and the 2002 QUAKE that rocked Alaska. Depart from and return to the Anchorage Hilton. Price per person: \$45.00

17:30 - 19:00

Exhibit Showcase Opening Reception

Egan Convention Center, Explorer's Hall

Enjoy complimentary beverages and light hors d'oeuvres while meeting with vendors. Apply for a free one year IEEE GRSS affiliate membership (details available on the membership page of the program.) We appreciate your continued support of the companies who complement the IGARSS technical program each year.

09:00 - 16:00

Matanuska Valley and Iditarod Tour

— CANCELLED

19:00 - 21:30

IEEE GRSS Technical Committees and Chapter Dinner

Anchorage Hilton, Chart Room

— TICKETS AVAILABLE

All GRSS Technical Committee Chairs, Chapter Chairs, and those interested in an active participation in the Society's activities are encouraged to attend and participate in the annual Technical Committee Dinner (previously held as a luncheon). This annual event at IGARSS provides a special opportunity for GRSS Technical Committee and Chapter Chairs to network and share ideas with others and to report on their significant activities or raise issues to this larger, international forum of GRSS members. Examples include upcoming workshops or symposia in GRSS and related fields, local Chapter activities or other opportunities near their local area.

During this dinner, the Vice President for Technical Activities will introduce the Technical Committee chairs who will provide Technical Committee Reports. This is followed by the Administrative Committee representative for GRSS Chapter activities describing briefly the significant events in Chapters during the previous year, introducing the Chapter Chairs or representatives in attendance and giving them an opportunity to provide information to the group. For more information about the various GRSS Technical Committees and Chapters, please visit the GRSS website, <http://ewh.ieee.org/soc/grss/>. Price per person: \$20.00

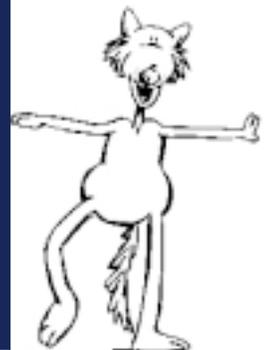
Riverdance

Thursday - Saturday, September 16-25

Atwood Concert Hall

Performing Arts Center

This highly acclaimed celebration of Irish music, song and dance from around the world features an international company. This event is offered through the Anchorage Concert Association. Tickets may be purchased online at www.anchorageconcerts.org or via phone to 907.272.1471. Tickets are not available for this event through ADS or IEEE GRSS.



Tours and Events

Wednesday, September 22

09:00 - 17:00

Sea Kayaking in the Prince William Sound (guided tour) — CLOSED

Guests will travel by mini coach along the Turnagain Arm and through two separate tunnels, one and two miles long respectively, through the Chugiak Mountain Range to the Port of Whittier. The kayaking adventure will begin with an orientation on the kayaks, and basic instruction on kayaking within the harbor. A guide will lead the group across the canal from Whittier to the busy hangout for the Black-Legged Kittiwake sea bird. A light lunch will be provided along the way. Participants will continue to enjoy hidden coves, waterfalls and glacial views of the Sound as you paddle your way back to Whittier. This peaceful mode of travel is an intimate way to experience the pristine wonders of this remote and beautiful part of Alaska. This is a good trip for those wanting an introduction to sea kayaking, moderate exercise and a real Alaskan adventure. Dress: Participants should dress in layers, conditions can be 45 degrees rainy or 75 degrees sunny. Bring an extra set of dry clothing and a hat. Price Per Person: \$162.00

18:30 - 20:30

Americas versus the Rest-of-the-World Soccer Game

Complimentary to all GRSS participants and guests. In 2003, over 200 persons participated in or observed tournament play, made necessary by the large number of players. In order to accommodate persons wishing to participate, reservations via the registration form are requested. Persons who did not register to play via the registration form, may do so at the on-site Registration Desk.

The playing field is within walking distance — maps available at the Registration Desk.

Thursday, September 23

Allure Day Spa Package — PACKAGES CLOSED*

“Bathe your senses in unique and peaceful surroundings. Indulge, relax and rejuvenate your mind and body” at Alaska’s largest day spa. Allure Day Spa is nestled in the heart of historical downtown Anchorage. Guests will be pampered with a European-style aromatherapy facial, Allure manicure, and a 50-minute relaxing, therapeutic full body massage. Space is limited for this 2.5 hour spa package. The spa package time slots are as follows: 08:00, 10:00, 12:00, and 14:00. Guests are asked to request their top three time choices when registering for this package. Price Per Person: \$175.00; guests are on their own for transportation.

**IGARSS 2004 guests who did not reserve a pre-arranged package may schedule spa services with Allure directly. Allure’s hours are 9:00 - 17:00 Monday through Saturday. To make an appointment, call 907.258.1122.*

08:00 - 17:00

Sea Life Center Technical Tour — CANCELLED

12:30 - 17:30

Winner Creek Hike — CLOSED

This trip is for those who prefer to get some exercise as they explore new areas. Guests will depart Anchorage heading south on the Seward Highway along the Turnagain Arm of Cook Inlet. With the Chugach Mountain Range on one side of the highway, Cook Inlet on the other, the Alaska Range across the inlet, and the Kenai Range in front of the coach, the scenery along this stretch of highway is nothing short of spectacular. Guests will want to keep their eyes alert for beluga whales in the inlet, Dall sheep on the mountainsides, and moose in fields or near ponds. The bald eagle is also a frequent sight along this stretch of road. The destination will be the base of Alyeska Ski Resort for a 2.5 hour guided hike on the Winner Creek Trail, a historic trail that marks the early route between Seward and Anchorage. The guided hike will cover 4 miles of the route and is suited for the fit walker who averages 1-2 miles of walking a week. The trail is marked with spectacular views of meadows and natural wildlife. The trail is easy and follows Winner Creek.

Participants will need light hiking boots or tennis shoes and jacket. The trail can be muddy. Following the hike there will be a brief stop at the Jade Shop in Alyeska where the owners have accumulated an incredible collection of Alaskan artifacts. Price per person: \$96.00

Tours and Events

Thursday, September 23, cont.

18:30 - 22:00

IEEE GRSS Awards Banquet at the Fourth Avenue Theater

— TICKETS AVAILABLE

“Travel” to Alaska’s interior, viewing the aurora borealis and breathtaking landscapes, while feasting on Alaskan king crab and honoring colleagues awarded the Society’s highest honors. In a wilderness setting, guests will be enveloped in the tradition of Alaska’s native people as portrayed by native Yup’ik storyteller, Cup’Luaraq (Jack Dalton). Through the story “The Raven” Cup’Luaraq, serving as an ambassador for and bridging the gap between the worlds of Native and non-Native peoples, will educate guests in the ways of Alaska’s indigenous people. Join us for an evening of enchantment, discovery and surprises! Price Per Person: \$75.00; guests may walk to the venue which is located one block west of the convention center.

Join us in honoring the following award recipients ...

2004 IEEE Judith A. Resnik Award
Anthony W. England

2004 IEEE Electromagnetics Award
Jin Au Kong

IEEE Fellows Recognition
Jan I.H. Askne
Jon Atli Benediktsson
Venkatachalam Chandrasekar
Ya-Qiu Jin
Yasuo Kuga
Russell Jean Lefevre
Alberto Moreira
Gregory Steffes
Harry Bruce Wallace
Thomas Turner Wilheit

2004 Distinguished Achievement Award
Paolo Pampaloni

2004 Outstanding Service Award
Charles A. Luther

2004 Education Award
William J. Emery

2003 Transactions Prize Paper Award
Piefrancesco Lombardo
Christopher J. Oliver
Tiziana M. Pelizzeri
Marco Meloni

2003 Transactions Prize Paper Award
Yoram J. Kaufman
Didier Tanre
Jean-Francois Leon
Jacques Pelon

2003 Symposium Prize Paper Award
J.P. Dugan

2003 Interactive Session Prize Presentation Award
E. Collin
C. Titan-Schnaider
W. Tabbara

2004 Student Prize Paper Award

Certificate of Recognition
Gary G. Gimmestad

Post-Conference Tours

07:30 - 17:30

Kenai Fjords National Park Wildlife & Glacier Cruise — CANCELLED

Kenai River Scenic Float — CANCELLED

Fairbanks – Aurora Adventure — CLOSED

Saturday, September 25, and Sunday, September 26

Join us for a true Alaskan adventure on a two-day, post-conference excursion. On Saturday, September 25, travel 50 minutes by air to Fairbanks, Alaska, enjoying spectacular views along the way. Your adventure will begin with a visit to one of the best museums in the state and will be followed by a tour of the Geophysical Institute of the University of Alaska, which hosts the AEIC (Alaska Earthquake Information Center), ASF (Alaska Satellite Facility), AVO (Alaska Volcano Observatory) and other research facilities. You will end your first day at the Chena Hot Springs Resort, where you may view the spectacular, mysterious, awe-inspiring aurora borealis (the Northern Lights). An evening lecture and slide show will be presented by one of the Geophysical Institute research faculty. On day two, guests will travel by shuttle to the Two Rivers Lodge for lunch/brunch before heading to the Large Animal Research Station (LARS) where you can view musk oxen together with reindeer and caribou as they graze in research pastures. In closing, your late afternoon flight will return you back to Anchorage. *To participate in this tour, we recommend your departure on SUNDAY, September 26, out of Anchorage. Schedule your flight for 8:30 pm or later (lunch/brunch included in package).* Price per person: \$680.00

US National Commission of URSI, Commission F, Meeting

Tuesday, 21 September 2004

18:00 - 20:00

***Anchorage Hilton Hotel, Fireweed Room
(open to all members)***

The US National Commission of URSI meeting augments the annual business meeting, held at the USNC Radio Science Meeting in January. This secondary business meeting provides an opportunity for members to convene and catch up with USNC activities.

Looking for Land Processes Data? ASTER and MODIS

Wednesday, 22 September 2004

18:00 - 22:00

***Egan Convention Center, Space 1
(reservation required)***

The following workshop is presented by NASA's Earth Science Enterprise, Data and Services, Land Processes Distributed Active Archive Center (LP DAAC). The Land Processes DAAC is hosted at the USGS EROS Data Center in Sioux Falls, South Dakota.

During this workshop, we will present details on the ASTER instrument of the Terra satellite, and the MODIS instrument from both the Terra and Aqua satellites, including information on the specific properties of the data along with an overview of the instruments that collect the data. Next, we will describe the methods of locating these data on-line; review available data sets through quick look browse images, and how to order these data to be delivered to your desktop. We realize that simply obtaining these data is certainly not the conclusion of your work but is only the beginning. So we will present a variety of tools available to you to help manipulate your data, along with some examples of possible applications of these data.

From first time to the advanced user, our LP DAAC User Services team stands ready to assist you with your data needs. This is an introductory level workshop; no experience with ASTER or MODIS Data is required. *Complimentary; see registration form to reserve a seat.*

Tutorials will be held on Sunday, 19 September 2004. Continuing Education Units (CEUs) will be granted for each paid tutorial participant after verification of attendance. Most tutorials will be half-day sessions so there will be an opportunity for participants to enroll in two half-day sessions (AM and PM) if there is interest in attending more than one tutorial. Lunch will be provided for full-day tutorial participants and for those attending two half-day tutorials. Registration for one or more tutorials may be done via the conference registration form. All tutorial participants must check in at the Registration Desk prior to the tutorial start to obtain a name badge and workbook.

T1: Remote Sensing of Forests: Basics to Applications

Instructor: Olaf Niemann

Time: Half-Day AM, 08:30 - 12:00

This tutorial will cover a range of remote sensing tools commonly used to address forestry related issues. The tutorial will initially focus on the available types of data/imagery and the tools that are available for their analyses. The tutorial will explore some of the more traditional as well as newer technologies and tools used to analyze forest environments, including aerial photography, satellite imagery, hyperspectral imagery, and LiDAR. This will lead into a discussion of application examples. The first will focus on the use of high spatial resolution imagery, such as aerial photography and the higher resolution satellite imagery, to address forest inventory issues. Approaches to using these types of imagery include more traditional manual interpretation to automated information extraction techniques. A second area will focus on the current trend in forestry related to the maintenance of sustainable forests. This area involves not only the concept of the economic value of trees, but also extends to other non-timber values of the forest. A number of different remote sensing tools can be used to answer some of the monitoring goals of this approach to forest stewardship. Finally, we will explore some of the issues of forest health and the use of remote sensing to detect and monitor forest canopies as well as individual trees.

T2: Urban Applications of Remote Sensing

Instructor: Paolo Gamba

Time: Half-Day PM, 13:30 - 17:00

The majority of the world's population lives in cities or major urban areas. Densely populated urban areas are ones in which the quality of human life and the state of the natural and physical environment are inextricably linked. In order to optimize the health and quality of life of the population who live in cities, there is a significant need for new strategic planning policies that take account of both local and regional land use, and also of short and long term trends in urban development and environmental change. Thus, there is a need for geographical information about urban areas, and remote sensing of urban areas provides an efficient methodology for populating GIS databases. Specifically, remote sensing fulfills the demands of: (i) frequent/continuous update of the information database, so that the problem of obsolescence is intrinsically solved;

(ii) collection of information in areas, where due to the economic and geographic context it would be difficult to gather appropriate data otherwise (as for example in developing countries); (iii) reduction of the costs of the information input and extraction. The aim of this tutorial is to provide an overview of the applications and techniques that are currently developed in the exciting field of urban remote sensing. Attendees will be provided tools for understanding the opportunities and trends in remote sensing data analysis for a variety of applications, from macroscale urban planning to microscale building extraction and road network characterization.

T3: Hyperspectral Image Processing and Analysis for Land Cover Characterization

Instructor: Jay Pearlman and Melba Crawford

Time: Half-Day PM, 13:30 - 17:00

The increasing availability of airborne and space-based hyperspectral imagery provides opportunities to characterize land surfaces for a range of vegetation environments. Sensors such as AVIRIS, HYMAP and Hyperion provide a range of sensing capabilities and data sets. With the advent of the space-based Hyperion imager, time series of data have become possible, and routine acquisitions on a monthly basis can provide an additional dimension for vegetation analysis. The objective of this tutorial is to provide the background necessary for understanding the capability and limitations of hyperspectral analyses. An overview of the fundamental processes for hyperspectral analysis will be provided followed by a detailed discussion of the issues and techniques associated with data correction and calibration. With pushbroom systems such as Hyperion, additional data processing steps are required to create radiometrically and geometrically consistent data sets that can be used for analyses in the space and time domains. Once the data have been preprocessed, techniques for classification and analyses of land cover can be employed. While hyperspectral data potentially provide greatly improved discrimination between land cover types, the increased number and resolution of spectral bands, many of which are highly correlated, is problematic for supervised statistical classification techniques when the training samples are small. These problems are exacerbated when the number of classes is large. The tutorial will also cover traditional approaches to classification and new methods recently developed for hyperspectral data analysis that include feature extraction and selection to mitigate the impact of these problems. Results will be examined under a variety of sensor and image conditions. Sample data sets will be provided for the participants.

T4: Interferometric SAR Principles and Theory

Instructor: Paul Rosen

Time: Half-Day AM, 08:30 - 12:00

This course presents the basic principles of Synthetic Aperture Radar (SAR) interferometry applied to height measurement and change detection applications. The course covers synthetic aperture imaging principles as needed for developing radar interferometry concepts. Interferometry is derived geometrically to build intuition about the strengths and limitations of interferometric systems. Equations describing the sensitivity of a height or change measurement to system errors and configurations provide a quantitative basis for this intuition. Interferometric correlation is introduced as a noise source and a useful measurement in its own right, and sources of decorrelation are identified. The course describes the interferometric processing chain and processing options, including interferogram formation and filtering, phase unwrapping, baseline estimation, height reconstruction, and various differential interferometric processing schemes. The concepts are presented with illustrative examples.

T5: Advanced Topics in Interferometric SAR

Instructor: Scott Hensley

Time: Half-Day PM, 13:30 - 17:00

This course builds on the "Interferometric SAR Principles and Theory" Tutorial T4, and is designed to introduce a number of the advanced concepts in use or under study in the field of interferometry. Topics covered will include ScanSAR interferometry, advanced unwrapping algorithms, cartwheel type systems, airborne interferometric applications including single pass and repeat pass motion compensation issues, tropospheric and ionospheric modeling and affects on interferometric data, permanent scatter techniques for differential interferometry and polarimetric interferometry. The material will be covered in sufficient depth to familiarize the student with the strengths and limitations of each concept, and where one might go to find more information. One or two "hot topic" areas will be covered in greater detail.

T6: Polarimetric SAR: Techniques, Applications, and the Future

Instructor: Richard Carande

Time: Full-Day, 08:30 - 17:00

In 1978 NASA launched the first spaceborne SAR system aboard the SEASAT satellite. Though the imaging sensor only lasted about 3 months, the incredible world of global SAR remote sensing was opened. In the intervening quarter-century, the techniques associated with SAR has grown immensely: Polarimetry, multi-frequency, interferometry and other advanced techniques have taken our "black and white" SAR imagery and turned it to color. The information content goes well beyond this simple color analogy. The coherent phase information associated with SAR data allows one to make extremely sensitive measurements of the earth's surface. While there have been many examples of the valuable sort of information can be extracted from polarimetric SAR data, these have been limited to airborne and Shuttle based demonstration systems - systems which have limited observing capabilities. Continuous observations over long periods of time have been essentially non-existent. However, EnviSAT's ASAR system is now operational and RADARSAT-2 and PALSAR will be in orbit shortly. These systems will be providing polarimetric and repeat-pass interferometric data worldwide. We currently stand on the threshold of a new era where these new polarimetric SARs will be in space, able to continuously monitor our world in "full color". In this tutorial we will review the advances in SAR that have been demonstrated over the past two decades with respect to polarimetry and interferometry, and review the fundamental theory behind these systems along with their capabilities and limitations. The course will then provide a description of the types of applications that will benefit from these new spaceborne systems becoming operational, along with the potential and value of continuous worldwide monitoring. Discussion of polarimetric-interferometry will also be included.



--	--

IGARSS 2004 Technical Program



Honored Speakers

Lieutenant Governor Loren Leman

Lieutenant Governor Loren Leman's family history in Alaska goes back more than 200 years to a marriage in Kodiak between a Russian shipwright and an Alutiiq woman from Afognak. Gold miners, Alaska Natives, fishermen and missionaries have figured prominently in his family's history. He is the first person of Alaska Native ancestry to be elected to statewide office in Alaska. In addition to serving in the Alaska Legislature for 14 years, Lieutenant Governor Leman is a consulting civil/environmental engineer and fisherman. He and his wife Carolyn have three children—Joseph, Rachel and Nicole. Loren Leman grew up in Ninilchik where he graduated from high school. He received his bachelor's degree in Civil Engineering from Oregon State University and his master's degree in Civil/Environmental Engineering from Stanford University. He has also studied Arctic Engineering at the University of Alaska Anchorage.

Brigadier General John J. Kelly, Jr.

BGen (ret) Kelly serves as the Deputy Under Secretary of Commerce for Oceans and Atmosphere, National Oceanic and Atmospheric Administration (NOAA). He is responsible for the day-to-day management of NOAA's domestic and international operations. In addition, General Kelly is the United States' principal representative with the World Meteorology Organization (WMO) and is responsible for U.S. interactions with the WMO.

General Kelly has 39 years of experience in all facets of the weather field, including 21 years at the senior executive level in both government and private industry. He has broad experience in leading science-based service organizations, introducing change, and using and implementing technology and science.

General Kelly served as senior advisor on weather services for the Department of Commerce and conducted a bottom-up review of the National Weather Service (NWS) operation, plus NOAA and NWS management, planning, and budget policies and processes. He was NOAA's Assistant Administrator for Weather Services from 1998 to January 2004.

In the private sector, General Kelly was Director of Weather Systems for GTE Information Systems from 1994 to 1996. There he directed GTE's weather and aviation services business line and was responsible for client satisfaction and interface, strategic planning, business development and sales, profit and loss, and program management.

General Kelly retired from the Air Force in 1994 after serving for 31 years. His duties covered the entire spectrum of the weather field, from operational forecaster to chief scientist, to staff officer. He retired as Director of Weather Headquarters, U.S. Air Force.

General Kelly holds a bachelor's degree in chemistry from Seton Hall University and a master's degree in public administration from Auburn University. He also completed leadership programs at the Air Force Command and Staff College and the Industrial College of Armed Forces. General Kelly is an American Meteorological Society Fellow and has received numerous U.S. and international awards.

Mr. Alphonso V. Diaz

Mr. Alphonso V. Diaz is the Director of the National Aeronautics and Space Administration's (NASA) Goddard Space Flight Center (GSFC) in Greenbelt, Maryland. He was appointed to this position effective January 12, 1998. Previously, he had served as Goddard's Deputy Director since 1996. Prior to becoming Goddard's Deputy Director, Mr. Diaz was Deputy Associate Administrator for Space Science at NASA Headquarters from 1993 – 1996.

As GSFC Director, Mr. Diaz is responsible for planning, organizing, and directing NASA's Earth science, space science, and technology programs assigned to the Center. Goddard Space Flight Center is engaged in developing and operating scientific spacecraft. The Center continues to seek excellence in science and technology as demonstrated by many discoveries and advances in its history, from the first mapping of the Antarctic ozone hole to determining the very early structure of the universe.

From 1989 to March 1993, Mr. Diaz served as Deputy Associate Administrator and Chief Engineer of the Office of Space Science (Code S) at NASA Headquarters. In that capacity, he was responsible for management direction and oversight of the space science flight program policy, launch vehicle requirements, technology infusion requirements, and mission study reviews and assessments. Mr. Diaz led the Agency committee chartered by the Administrator to study proposals related to science institutes and to provide recommendations for implementation. Prior key positions with NASA include Deputy Associate Administrator for the former Office of Space Science and Applications (OSSA), Assistant Associate Administrator for Programs within OSSA, and Director for Strategic Plan and Programs for Space Station.

Mr. Diaz began his career at NASA's Langley Research Center in 1964. At Langley, he worked in a variety of technical management positions, principally on the Viking Project, GAS Chromatograph Mass Spectrometer. This scientific instrument was the first to analyze the surface material on Mars in 1976. In 1979, Mr. Diaz began his work at NASA Headquarters, where he served in a variety of positions. Aside from positions mentioned above, Mr. Diaz also has served as the International Solar-Polar Mission (now Ulysses Mission) Program Manager, the Galileo Program Manager, Manager of Planetary Advanced Programs, and as Deputy Director of the Solar System Exploration Division. He later served as Assistant Associate Administrator for Space Station within OSSA, managing all activities on the use of the planned Space Station for scientific research, and providing strategic planning guidance for OSSA's overall program of scientific exploration.

Mr. Diaz received four Presidential Rank Awards; three as Meritorious Executive in 1990, 1995 and in 2003, and one Distinguished Award in 1996. He also received five Medals, a NASA Outstanding Leadership Medal for his work at the Goddard Space Flight Center in 2002 and 2004, an Exceptional Service Medal for his work at the Goddard Space Flight Center in 1999, a NASA Outstanding Leadership Medal in 1994 for his work on the Hubble Space Telescope First Servicing Mission, and an Exceptional Scientific Achievement Medal for his work on the Viking Project in 1977.

Mr. Diaz received a Bachelor of Science in Physics from St. Joseph's University in Philadelphia, Pennsylvania and a Master of Science degree in Physics from Old Dominion University in Norfolk, Virginia. In addition, he attended the Massachusetts Institute of Technology (MIT) Sloan School of Management as a NASA Sloan Fellow and received a Master of Science in management in 1986.

He is an Associate Fellow of the American Institute of Aeronautics and Astronautics and is married to Angela Phillips Diaz. They reside in Takoma Park, Maryland.