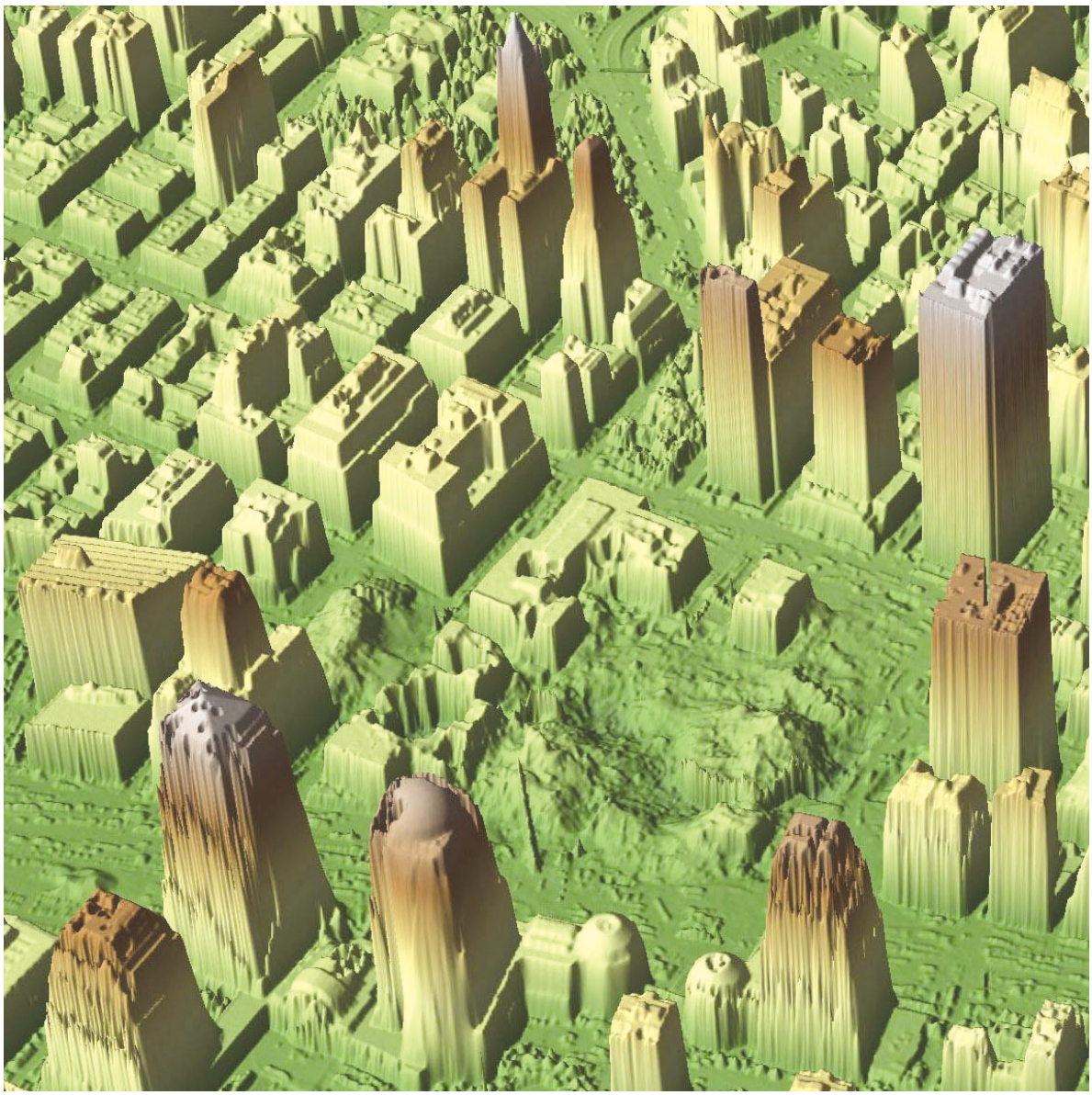
IEEE GEOSCIENCE and REMOTE SENSING
Newsletter

Editor: Steven C. Reising



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IEEE

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Ms. Susan Schneiderman
Business Development Manager
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445 Hoes Lane
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The following is the schedule for the GRS-S Newsletter. If you would like to contribute an article, please submit your input according to this schedule. Input is preferred in Microsoft Word, WordPerfect or ASCII for IBM format (please send disk and hard copy) as IEEE now uses electronic publishing. Other word processing formats, including those for Macintosh, are also acceptable, however, please be sure to identify the format on the disk and include the hard copy.

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Month	June	Sept	Dec	March
Input	April 15	July 15	Oct 15	Jan 15

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Editor's Comments

Steven C. Reising
Department of Electrical and Computer Engineering
113B Knowles Engineering Building
University of Massachusetts
Amherst, MA 01003-4410
TEL: 413.577.0697
FAX: 413.545.4652
E-Mail: reising@ieee.org

I would like to thank our outgoing President, Prof. Werner Wiesbeck, for the tremendous amount of time and energy he has devoted as a volunteer over the last two years to promote and fulfill the mission of our Society. The many advances during his term are outlined on this page in the first message from the incoming President, Charles Luther. I very much look forward to working for and with Chuck Luther on his new initiatives for the Geoscience and Remote Sensing Society.

This issue of the Newsletter features a NOAA article on the contributions of remote sensing to recovery efforts after the 9/11 terrorist attacks, an industrial profile, a book review, proposed amendments to the GRS-S Constitution and Bylaws, and a new organizational chart of the GRS-S AdCom. First, the cover image and accompanying article on p. 6 show and describe one way in which remote sensing systems have aided our domestic recovery. In his Message from the President, Chuck Luther invites our Society's members to explore and discuss how the remote sensing community can focus its resources and efforts to search for ways to detect and minimize threats from terrorism.

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Message from the President

Charles A. Luther
Office of Naval Research
800 North Quincy St.
Arlington, VA 22217
Phone: 703-696-4123
Fax: 703-696-2710
E-mail: lutherc@onr.navy.mil

Dear GRS-S Members:

It is with great enthusiasm that I assume the leadership role for the IEEE Geoscience and Remote Sensing Society for the year 2002. I have been either an affiliate or full member of this Society since 1984, and have played an active part in the Society's growth and maturation. Having seen the quality of leadership that guided this Society during that time, I feel especially honored to have been chosen to lead the GRS-S for the coming year.

I would like to start my term by affirming that the State of Affairs for the GRS-S Society is exceptional, thanks to the sterling efforts of the Administrative Committee during the past two years, under the leadership of the outgoing President, Dr. Werner Wiesbeck. Under his charge, we have experienced several significant advances. The most notable of these have been an upturn in the number of members, a progressive growth trend in attendance at the IGARSS Symposia, an increase in the number of TGARS issues per year from 6 to 12, and the initiation of a Sister Society agreement with the Canadian Remote Sensing Society, designed to strengthen the influence and impact of both Societies on the North American Continent. With these, as well as other impressive accomplishments not mentioned, the GRS-S is indeed a Society on the move. On behalf of the entire Society membership, I thank Werner Wiesbeck for his skillful leadership during these past two years.

Therefore, I am taking the reins of this premier organization with one singular motive, or goal: To Make the Best, Better. In that regard I have enumerated a number of new initiatives for the Society, primarily aimed at increasing the value of the Soci-

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Cover Figure Information

LIDAR image of lower Manhattan, New York, rendered Sept. 27, 2001 by the U.S. Army Joint Precision Strike Demonstration from data collected by NOAA.

NOAA's aircraft flew five missions from Sept. 23 to Oct. 15 over the World Trade Center to map ground zero using aerial photography and Light Detection and Ranging (LIDAR) technology.

Credit: NOAA

See the article beginning on p. 6 for details.

Editor's Comments

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Second, the industrial profile features Gematronik GmbH, in Neuss, Germany, a premier manufacturer of weather radar systems. The article focuses on innovations designed to compensate for range ambiguities in order to provide faster, more accurate volume scans of precipitation. Third, one of our Society's Past Presidents, Dr. Keith Raney, provides a review of Dr. Herbert Kramer's comprehensive volume on space-based and airborne systems for remote sensing of the Earth. Fourth, Dr. Kiyo Tomiyasu, one of our Society's Honorary Life Members, presents proposed amendments to the GRS-S Constitution and Bylaws for comment by the membership. Finally, the new GRS-S Administrative Committee officers and committee chairs are listed in an organizational chart on p. 11. Along with our incoming President Chuck Luther, I encourage all of us to find ways we can help "To Make the Best, Better."

President's Message

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ety to its membership, increasing the impact and influence of the Society on the international Remote Sensing community, and positioning the society to better contribute to the solution of environmental, economic, and social problems worldwide. These initiatives include to:

(a) Initiate agreements/joint activities with other select Societies through which the goals and objectives of the GRS-S and the participating Societies can be better achieved, and the Remote Sensing community better served.

(b) Increase the number of technical publications available to GRS-S members through cooperative arrangements with other appropriate Societies.

(c) Involve industry in Society activities to a greater extent, with the goal of creating mutual industry/Society benefit.

(d) Complete the launching of the new publication, *GRS Letters*, to enable a quicker, more informal communication outlet for preliminary research results, new ideas, etc., which can benefit the community and industry through early exposure.

(e) Increase membership in the society from the current 2400 to 3000.

In addition to these initiatives, there are critical issues of Homeland Defense, a problem of international scope that cannot be ignored by a Society such as ours. This issue has been raised before, and it is intensifying in nature and scope. One has only to note the devastating effects of terrorist attacks, as cap-

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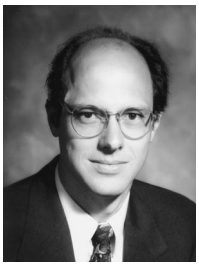
Newsletter Editorial Board Members:

Steven C. Reising, *Editor*
Department of Electrical and Computer Engineering
113B Knowles Engineering Building
University of Massachusetts
Amherst, MA 01003-4410
TEL: 413-577-0697
FAX: 413-545-4652
E-Mail: reising@ecs.umass.edu

Edward J. Kim, *Associate Editor for Organizational and Industrial Profiles*
Building 33, Room A426
NASA Goddard Space Flight Center
Mail Stop 975
Greenbelt, MD 20771
TEL: 301-614-5653
FAX: 301-614-5558
E-Mail: Edward.J.Kim.1@gsfc.nasa.gov

Adriano J. Camps,
Associate Editor for European Affairs
Department of Signal Theory and Communications
Polytechnic University of Catalonia,
Campus Nord D4-016
08034 Barcelona, SPAIN
TEL: (34)-93.401.60.85
FAX: (34)-93.401.72.32
E-Mail: camps@tsc.upc.es



Stephen J. Frasier,
Associate Editor for University Profiles
Department of Electrical and Computer Engineering
113D Knowles Engineering Building
University of Massachusetts
Amherst, MA 01003-4410
TEL: 413-545-4582
FAX: 413-545-4652
E-Mail: frasier@ecs.umass.edu

2002 AdCom Members' Names and Addresses

Mr. Charles A. Luther
(AdCom 2002-2004)
President, IEEE GRS-S
Office of Naval Research
800 N. Quincy Street
Arlington, VA 22217
USA
Phone: 703 696 4123
FAX: 703 696 2710
E Mail: lutherc@onr.navy.mil

Dr. Albin J. Gasiewski
(AdCom 2002-2004)
GRS-S Executive Vice President
IGARSS '06 General Co-Chairman
NOAA Environmental Technology Lab
325 Broadway R/ET1
Boulder, CO 80305
USA
Phone: 303 497 7275
FAX: 303 497 3577
E Mail: al.gasiewski@noaa.gov

Dr. Thomas J. Jackson
(AdCom 2002-2004)
GRS-S Secretary
USDA ARS Hydrology and Remote Sensing Lab
104 Bldg 007 BARC West
Beltsville, MD 20705
USA
Phone: 301 504 8511
FAX: 301 504 8931
E Mail:
tjackson@hydrolab.arsusda.gov

Dr. Jon A. Benediktsson
(AdCom 2000-2002)
GRS-S VP for Technical Activities
Department of Electrical and Computer Engineering
University of Iceland
Hjardarhaga 2-6
107 Reykjavik
ICELAND
Phone: +354 525 4670
FAX: +354 525 4632
E Mail: benedikt@hi.is

Dr. Andrew J. Blanchard
(AdCom 2002-2004)
GRS-S VP for Operations and Finance
College of Engineering
University of Texas at Dallas
P.O. Box 830688 EC-32
Richardson, TX 75083
USA
Phone: 972 883 4122
FAX: 972 883 2813
E Mail: ablanch@utdallas.edu

Dr. Karen M. St. Germain
(AdCom 2000-2002)
GRS-S VP for Meetings and Symposia
NRL Remote Sensing Division, Code 7223
4555 Overlook Avenue, SW
Washington, DC 20375-5351
USA
Phone: 202 767 3443
FAX: 202 767 9194
E Mail: karen.stgermain@nrl.navy.mil

Dr. Kamal Sarabandi
(AdCom 2001-2003)
GRS-S VP for Professional Activities
Dept. of Electrical Eng. & Computer Science
The University of Michigan
Ann Arbor, MI 48109-2122
USA
Phone: 734 936 1575
FAX: 734 647 2106
E Mail: saraband@eecs.umich.edu

Dr. Melba M. Crawford
(AdCom 2000-2002)
Center for Space Research
3925 W. Braker Lane, Suite 2000
The University of Texas at Austin
Austin, TX 78712-5321
USA
Phone: 512 471 7993
FAX: 512 471 3570
E Mail: crawford@csr.utexas.edu

Dr. William Emery
(AdCom 2001-2003)
Aerospace Engineering Sciences Dept.
CB 431
University of Colorado
Boulder, CO 80309
USA
Phone: 303 492 8591
Fax: 303 492 2825
E Mail: emery@frodo.colorado.edu

Dr. James A. Gatlin
Director of Finance
Goddard Space Flight Center
Code 532
Greenbelt, MD 20771
USA
Phone: 301 286 6680
FAX: 301 286 0232
E Mail: j.gatlin@ieee.org

Dr. David G. Goodenough
(AdCom 2000-2002)
Pacific Forestry Centre
Natural Resources Canada
506 West Burnside Road
Victoria, BC V8Z 1M5
CANADA
Phone: 250 363 0776
FAX: 250 363 0775
E Mail: dgoodeno@nrcan.gc.ca

Dr. Martti T. Hallikainen
(AdCom 2001-2003)
Helsinki University of Technology
Laboratory of Space Technology
P. O. Box 3000
FIN 02015 HUT
FINLAND
Phone: +358 9 451 2371
FAX: +358 9 451 2898
E Mail: Martti.Hallikainen@hut.fi

Dr. Verne Kaupp
(AdCom 2001-2003)
IGARSS '04 General Chairman
Alaska SAR Facility
University of Alaska Fairbanks
903 Koyukuk Dr., P. O. Box 757320
Fairbanks, Alaska 99775-7320
Phone: 907 474 7263
FAX: 907 474 6441
E Mail: vkaupp@asf.alaska.edu

Dr. Nahid Khazenie
Past President, IEEE GRS-S
8509 Capo Ct.
Vienna, VA 22182
USA
Phone: 703 508 0705
FAX: 703 917 8655
E Mail: n.khazeni@ieee.org

Dr. Anthony K. Milne
(AdCom 2002-2004)
University of New South Wales
School of Biological, Earth and Env. Sciences
Sydney, NSW 2052
AUSTRALIA
Phone: 61 2 9285 4897
FAX: 61 2 9451 4628
E Mail: t.milne@unsw.edu.au

Dr. James A. Smith
Transactions Editor
NASA Goddard Space Flight Center
Code 920
Greenbelt, MD 20771
Phone: 301 614 6020
FAX: 301 614 6015
E Mail:
jasmith@hemlock.gsfc.nasa.gov

Dr. Leung Tsang
(AdCom 2002-2003)
University of Washington
Department of Electrical Engineering, Box 352500
Seattle, WA 98195
USA
Phone: 206 685 7537
FAX: 206 543 3842
E Mail: eeltsang@cityu.edu.hk

Dr. Werner Wiesbeck
Past President, IEEE GRS-S
University of Karlsruhe
Institute for High Frequency and Electronics
Kaiserstrasse 12
76128 Karlsruhe
GERMANY
Phone: +49 721 608 2522 (or 7729)
FAX: +49 721 691 865
E Mail: werner.wiesbeck@ihe.uka.de

Dr. David Weissman
(AdCom 2000-2002)
Hofstra University
Dept. of Engineering
104 Weed Hall
Hempstead, NY 11549
USA
Phone: 516 463 5546
Fax: 516 269 5920
Email: eggdew@hofstra.edu

Dr. Keith R. Carver
Honorary Life Member
University of Massachusetts
Dept. of Electrical & Computer Engineering
Amherst, MA 01003
USA
Phone: 413 545 1665
FAX: 413 545 4611
E Mail: kcarver@ecs.umass.edu

Dr. Kiyo Tomiyasu
Honorary Life Member
Lockheed Martin Corp.
366 Hilltop Road
Paoli, PA 19301 1211
USA
Phone: 610 531 5740
FAX: 610 531 1190
E Mail: k.tomiyasu@ieee.org;
kiyo.tomiyasu@lmco.com

Dr. Fawwaz T. Ulaby
Honorary Life Member
The University of Michigan
4080 Fleming Building
Ann Arbor, MI 48109 1340
USA
Phone: 734 764 1185
FAX: 734 763 0085
E-Mail: ulaby@eecs.umich.edu

Ms. Lisa Ostendorf
Director of Information Services
IEEE Geoscience and Remote Sensing Society
63 Live Oak Lane
Stafford, VA 22554
USA
Phone: 540 658 1676
FAX: 540 658 1686
E Mail: ostendorf@msn.com

Ms. Tammy Stein
Director of Conferences
IEEE Geoscience and Remote Sensing Society
17906 St Emilion Court
Spring, Texas 77379
USA
Phone: 281 251 6067
FAX: 281 251 6068
E-Mail: grss@ieee.org

Prof. Ram M. Narayanan
Director of Corporate Relations
University of Nebraska Lincoln
Dept. of Electrical Engineering
209N Walter Scott Engineering Center
P. O. Box 880511
Lincoln, NE 68588-0511
USA
Phone: 402 472 5141
FAX: 402 472 4732
E-Mail: rnarayanan@unl.edu

Dr. Steven C. Reising
Newsletter Editor
Department of Electrical and Computer Engineering
113 Knowles Engineering Building
University of Massachusetts
Amherst, MA 01003 4410
USA
Phone: 413 577 0697
FAX: 413 545 4652
E Mail: reising@ieee.org

Dr. R. Keith Raney
GRSS Rep. to Soc. on Social Implications of Technology
Johns Hopkins Univ. Applied Physics Lab
Space Dept.
Johns Hopkins Rd.
Laurel, MD 20723 6099
USA
Phone: 240 228 5384
FAX: 240 228 5548
E Mail: keith.raney@jhuapl.edu

Dr. John A. Reagan
PACE Representative
University of Arizona
ECE Dept., Bldg. 104, Rm. 230
Tucson, AZ 85721 0104
USA
Phone: 520 621 6193
FAX: 520 621 8076
E Mail: reagan@ece.arizona.edu

Dr. Ellsworth LeDrew
IGARSS '02 General Chairman
University of Waterloo
Geography Department
200 University Ave. West
Waterloo, Ontario N2L 3G1
CANADA
Phone: 519 888 4567 x 2783
FAX: 519 888 6768
E-Mail: ells@watleo.uwaterloo.ca

Dr. Didier Massonnet
IGARSS '03 General Chairman
CNES
18 Avenue E Belin
Toulouse Cedex 31401
FRANCE
Phone: +33 5 61273418
FAX: +33 5 61273167
E-Mail: didier.massonnet@cnes.fr

Dr. Wooil M. Moon
IGARSS '05 General Chairman
Seoul National University
Dept. of Earth System Science
Kwanak-gu Shilim-dong San 56-1
Seoul, 151-742
KOREA
Phone: 82 2 880 8898
FAX: 82 2 871 3269
E Mail: wmon@eos1.snu.ac.kr
or
University of Manitoba
Geophysics Dept.
Winnipeg, MD R3T 2NT
CANADA
Phone: 204 474 9833
FAX: 204 474 7623
E Mail: wmoon@cc.umanitoba.ca

Dr. V. Chandrasekhar
IGARSS '06 General Co-Chairman
Electrical and Computer Engineering Dept.
Colorado State University
Fort Collins, CO 80523 1373
Phone: 970 491 7981
FAX: 970 491 2249
E Mail: chandra@engr.colostate.edu

Dr. Ignasi Corbella
IGARSS '07 General Chairman
UPC – TSC
Despatx: 208, Campus Nord – Edif. D3
C. Jordi Girona, 1-3
08034 Barcelona
SPAIN
Phone: 34 93 4017228
FAX: 34 93 4017200
E Mail: corbella@tsc.upc.es

NOAA Remote Sensing Expertise Aids World Trade Center Recovery Efforts

National Oceanic and Atmospheric Administration (NOAA), Washington, DC 20230
URL: http://noaanews.noaa.gov

NOAA's aircraft flew five missions totaling more than 16 hours over the World Trade Center after the events of September 11 to aid in recovery efforts. NOAA's Citation jet mapped ground zero using aerial photography and light detection and ranging (LIDAR) technology. The flights began September 23 and ended October 15. Each flight lasted about four hours.

The plane flew at an altitude of between 3,000 and 7,000 feet during its various flyovers. Teams from NOAA's National Geodetic Survey and Aircraft Operations Center worked on scene at the request of the U.S. Defense Department. NOAA's jet also took high-resolution photos of the area. These photos show ground zero in great detail. They also allow the recovery crews to see how far debris fell from the site. The NOAA jet also flew a mission over the Pentagon.

NOAA's efforts in New York began on the ground on September 15 as NGS field survey personnel provided the necessary ground support and calibration expertise for the airborne imaging sensors, high-resolution cameras and laser ranging devices. These airborne and ground-based systems produced very accurate map products at ground zero and the surrounding area affected by the terrorist attack. The NOAA team used the global positioning system (GPS) to position both ground and airborne mapping sensors.

The NOAA Citation jet, usually used for remote sensing and high-resolution photography for coastal mapping, was outfitted with an Optech LIDAR. Collecting both LIDAR data and high-resolution photography, the Citation flew over a five-square kilometer area of lower Manhattan. The U.S. Army Joint Precision Strike Demonstration initiated and coordinated the entire effort. They worked closely with NOAA, Optech Inc. and the University of Florida to produce the images and map products.

After the initial flights of September 23 and 26, the NOAA jet flew three more missions where the entire area of lower Manhattan was mapped using the LIDAR equipment, which was furnished by Optech Inc. of Toronto, Canada. The images were rendered by the U.S. Army from the data collected by NOAA's aircraft.

The data collected by the LIDAR equipment helped to produce 3-D images of the site where crews completed their recovery and cleanup efforts. These images helped to identify the height of the rubble so that the appropriate cranes could be used to remove it. The data collected from the flyovers provided building and utility engineers the information needed to locate original foundation support structures, elevator shafts and basement storage areas. This allowed the crews to pinpoint their digging and recovery efforts.

The first mission over the World Trade Center site proved to be an emotional one for the NOAA crew. Lt. Cdr. Brad Kearse, who piloted the plane, said that as the aircraft neared ground zero everyone fell silent. "It was the quietest flight that I can remember. No one said a word for more than three-and-a-half hours. The crew went about its business of mapping the site and occasionally looking out the window to view the devastation below."

NOAA, as well as other federal agencies, is now doing an inventory of its assets to see how they can help in the effort of homeland security.

Call For Nominations for the GRS-S Administrative Committee

DEADLINE: JUNE 15, 2002

The Nominations Committee calls upon our membership to nominate members to serve on the GRSS AdCom. A **nominating petition** carrying a minimum of five names of Society members, excluding students, shall automatically place that nominee on the slate although the Nominations Committee may choose to include a name on the slate regardless of the number of names on the nominating petition. Your nominees should **confirm in writing** their willingness to stand for election.

A brief biography of the nominee, similar to that used for TGARS authors, will be required and should be **submitted** with the nominating petition **by June 15, 2002,** to the GRS-S Nominations Committee, c/o David Weissman, Nominations Chair, Hofstra University, Department of Engineering, 104 Weed Hall, Hempstead, New York 11549, U.S.A., Fax: (631) 269-5260; E-mail: eggdew@hofstra.edu

The slate derived by the Nominations Committee shall be presented to the Society membership at large via mail ballot, and the three candidates receiving the greatest number of votes shall be elected. The Administrative Committee shall hold an Annual Meeting in November 2002 after the results of this vote are known at which time elections will be held to fill the remaining two regular vacancies in the Administrative Committee to occur on January 1, 2003.

Our AdCom consists of 15 elected persons, each of whom serves for three years. Their terms are overlapping to assure continuity. Additional information on the Society and the AdCom is available at http://ewh.ieee.org/soc/grss.

There is no remuneration for serving on the AdCom, other than the knowledge and recognition of having made additional contributions to the well-being of our colleagues and our profession.

We need your involvement and support!

INDUSTRIAL PROFILE

Gematronik: Next-Generation Doppler Weather Radar with Second Trip Recovery

Gabriele Kadner and Frank Gekat
Gematronik GmbH
Doppler Weather Radar Systems
P.O. Box 21 03 51, 41429 Neuss, Germany
Email: g.kadner@Gematronik.com, f.gekat@Gematronik.com
http://www.gematronik.com

Introduction

Gematronik was founded in 1961 to provide logistics, installation, maintenance services and training for military and surveillance radars. In the 1970s Gematronik developed the first weather radar of the METEOR series. This type of radar provides reflectivity data representing precipitation intensity. In 1987 Gematronik introduced the first Doppler radar, METEOR 360, to measure the radial velocity of meteorological targets. The next-generation weather radars, METEOR 500/1500, were introduced successfully in 1998. They feature an advanced digital receiver and signal processor, a new radar control and monitoring system, and visualization and control software.

Today Gematronik is a worldwide leader in manufacturing weather radar systems, with a full product line of magnetron and klystron radars operating at C-band and S-band. They also offer international turnkey project management. A comprehensive METEOR radar network is now being realized in Poland and Venezuela.

Doppler Weather Radars

Doppler weather radars measure the radial velocity and reflectivity of particles in the atmosphere, mainly of precipitation. The rainfall rate can then be estimated from reflectivity measurements. Doppler information is valuable for weather forecasters, especially in severe weather where it allows the identification of rotation signatures (indicative of tornado risk), and of divergence signatures (indicative of strong downdrafts when observed near the surface).

Gematronik weather radars are available at two different frequency bands: C-band and S-band. For moderate climate conditions most weather services use C-band radars operating at a frequency between 5.5 and 5.8 GHz. In tropical areas with severe rainfalls and in hurricane-prone areas S-band radars are preferred, operating at frequencies between 2.7 and 2.9 GHz. The longer wavelength encounters less attenuation due to precipitation, hence it causes fewer errors in rainfall rate estimation. The maximum range is 500 km for reflectivity data and 250 km for velocity data. A typical volume scan can be run in 5 to 15 minutes, and 10 to 12 elevations are required for each scan.

Gematronik Doppler weather radars are designed for continuous, unmanned operation. Racon®, the advanced radar control and monitoring system, allows remote control and real-time system and data monitoring. After each scan the meteorological application software processes the selected radar products. This software, called Rainbow®, includes products for nowcasting, forecasting, severe weather detection, tracking and warning, hydrology and airport surveillance. It is utilized by weather services, airport authorities, hydrologists and research institutes worldwide. Doppler radar products are used to detect and predict severe weather conditions, such as thunderstorms, localized microbursts, gust fronts, wind shifts and severe precipitation.

Figure 1: Meteor 1500S, a klystron-based, S-band Doppler weather radar, in Ken Ting, Taiwan.

Second-Trip Recovery Mode

If backscattered signals from distant targets reach the antenna after a subsequent pulse has been emitted, the echo will

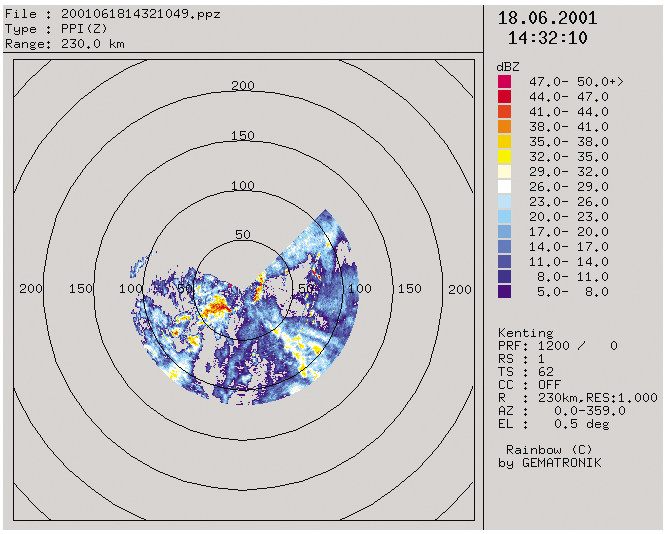


Figure 2: A radar scan from Ken Ting, Taiwan with 1200 Hz PRF and an unambiguous range of 125 km.

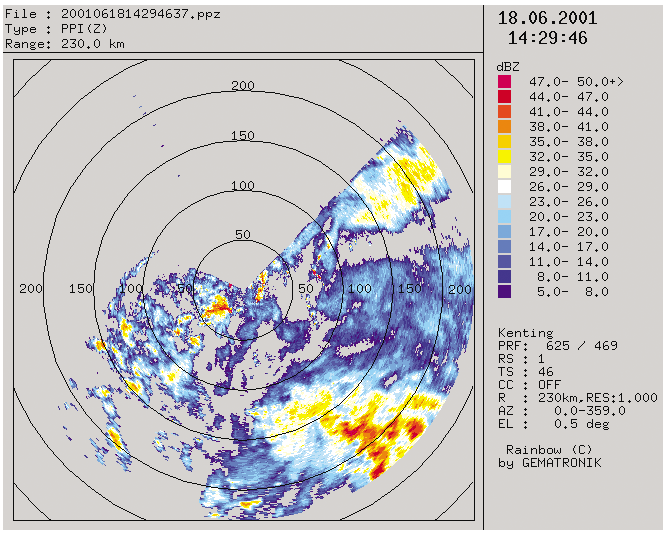


Figure 3: A radar scan from Ken Ting, Taiwan with 625 Hz PRF and an unambiguous range of 240 km.

be displayed in the wrong range interval, resulting in a second-trip echo. In order to correct this, Gematronik implemented second-trip echo recovery [1], an advanced digital signal processing technology for the klystron weather radar, METEOR 1500. An important component required for this signal processing feature is a programmable signal source capable of synthesizing flexible IF waveforms with low phase noise. These waveforms can be realized with the help of a dual-channel IF waveform generator developed by Lassen Research [2]. This waveform generator is designed to work with the Gematronik digital receiver and is fully programmable and controlled online by the signal processor Aspen® DRX.

Waveform Generator Application

The dual-channel IF waveform generator provides features such as pulse-to-pulse phase coding or pulse compression to support second-trip echo suppression or recovery. The waveform generator can support virtually any type of waveform, including phase-coded sequences, nonlinear FM sequences, complex Doppler-tolerant waveforms, and frequency-hopping sequences. Long compression waveforms suitable for solid-state transmitters are supported by the large waveform memory, and it is possible to store several waveforms to create phase sequences of compressed waveforms, for Doppler simulation or second-trip echo recovery. Additionally, the waveform generator optimizes the use of the occupied bandwidth and provides pre-distortion of exciter signals in order to improve the sub-clutter visibility of the radar.

Example of Second-Trip Recovery in Ken Ting, Taiwan

In Taiwan three METEOR 1500S weather radars are operating in second-trip recovery mode. Example observations from Ken Ting, Southern Taiwan (Figure 1) are shown as PPI (Plan Position Indicator) displays (Figures 2-4) of corrected reflectivity data.

Figure 2 shows a normal scan with a pulse repetition frequency of 1200 Hz, resulting in an unambiguous range of 125 km. Second-trip echoes are visible in southeast between 50 km and 100 km range. Figure 3 includes a normal scan with a pulse repetition frequency of 625 Hz, resulting in an unambiguous range of 240 km. This reflectivity display is free of second-trip echoes. Finally, Figure 4 shows a scan with a pulse repetition frequency of 1300 Hz in second-trip recovery mode, resulting in an unambiguous range of 230 km. The second trip echoes that were detected in Figure 2 are displayed in the correct range interval in Figure 4. Additional second-trip signals have been moved to their correct positions.

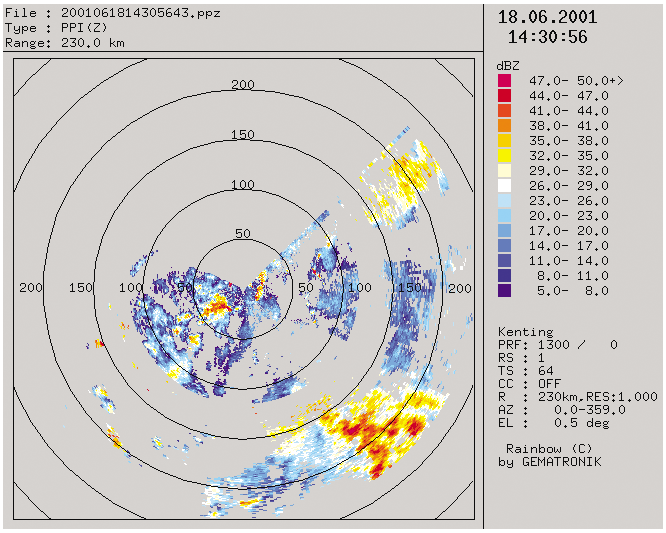


Figure 4: A radar scan from Ken Ting, Taiwan with 1300 Hz PRF and an unambiguous range of 230 km.

The second-trip recovery mode is a valuable method to reduce the probability of occurrence of velocity and range ambiguities. It also increases the coverage of radar data. With this innovation, radar scans can be performed up to large ranges with high pulse repetition frequencies. We anticipate that in the future phase coding technology will be used extensively for second-trip recovery. Currently, phase coding for second-trip recovery has been proposed for scanning the lowest elevations using the WSR-88D weather radar network (NEXRAD) [3].

Additional information on Doppler weather radar design, performance and application are available at: .

References

[1] Siggia, A., Random Phase Codes for Doppler Weather Radars, Master's Thesis, MIT, 1983.

[2] Lee, R.[(1)], A. Volpi[(2)], J. Borgmann[(3)], and F. Gekat[(3)], Digital waveform generator for weather radars, *30th International Conference on Radar Meteorology*, AMS Conference, Munich, Germany, July 2001.

[3] Zrnic, D. S., and R. D. Cook, Evaluation of techniques to mitigate range and velocity ambiguities on the WSR-88D, *82nd AMS Annual Meeting, 18th International Conf. on Interactive Information Processing Systems for Meteorology, Hydrology, and Oceanography*, Orlando, Florida, January 2002.

(1) Lassen Research, Manton, California, USA.
(2) Eldes Lassen International, Florence, Italy.
(3) Gematronik GmbH, Neuss, Germany.

Amendments to GRS-S Constitution and Bylaws

Kiyo Tomiyasu

Over the past several years, the activities of the IEEE Geoscience and Remote Sensing Society (GRS-S) have increased significantly, as evidenced by (a) the expanded volume of the *IEEE Transactions on Geoscience and Remote Sensing*, and (b) the number of and size of GRS-S sponsored and co-sponsored conferences and symposia.

To support and administer these enhanced activities, the Administrative Committee (AdCom) of GRS-S discussed and passed amendments to its Constitution and Bylaws at its meeting on February 3, 2002. The amendments increase the number of members on AdCom, and the quorum required for conducting its meetings. These amendments are published in this *GRS-S Newsletter* for approval by the GRS-S membership as required by the GRS-S Constitution and Bylaws. If no objections are communicated to me by June 15, 2002, these Amendments will be considered final, and forwarded to IEEE Headquarters.

The words to be deleted are in *italics* and underlined, and the amended words are in **bold** font.

CONSTITUTION

Paragraph VI.1: AdCom Size

The Society shall be managed by an Administrative Committee (AdCom) of no less than *12* **15** and no more than *15* **18** members of the Society, plus Past Presidents and additional Ex-Officio Members as provided in the Bylaws.

BYLAWS

Paragraph V.1: The Administrative Committee

The Administrative Committee consists of *12* **15** to *15* **18** members elected in accordance with Paragraph II plus the Past-Presidents and additional Ex-Officio members as appointed. The Administrative Committee is also referred to as the AdCom.

Paragraph III.3: Quorum

The number of Administrative Committee members that constitutes a quorum will depend upon the total number of members on the Administrative Committee. A quorum of the AdCom will be one third of the membership but not less than *5* **6**. An Ex-Officio member is not included in the quorum count.

Please contact:
Dr. K. Tomiyasu
Chairman, IEEE GRS-S Constitution and Bylaws Committee
366 Hilltop Road
Paoli, PA 19301-1211
Tel. 610-531-5740
E-Mail: k.tomiyasu@ieee.org

BOOK REVIEW

Observation of the Earth and Its Environment—Survey of Missions and Sensors, 4th Edition

by Herbert J. Kramer, Springer-Verlag, Berlin, 2001, ISBN 3-540-42388-5, $199. 522 figures, 857 tables, 1510 pages (hard copy), 1923 pages (CD-ROM).

Reviewed by R. Keith Raney, Ph.D., Johns Hopkins University Applied Physics Laboratory.

Simply stated, this remarkable book is an essential resource for anyone concerned with any aspect of Earth-centered remote sensing. Now in its fourth Edition, and blessed for the first time with a complete CD-ROM (that includes more than 400 pages of resource material that is not in the hard copy), this encyclopedic monograph captures the entire field of space-based and airborne systems, instruments, campaigns, and much more. Although the price might dissuade purchase for personal use, at less than 1/10th the cost of a single frame of decent space-based imagery, it is a steal. No laboratory, agency, technical library, or serious practitioner concerned with remotely sensed data or systems should be without this work.

Dr. Kramer has chosen–wisely in my view–to make extensive use of tables. These invariably present a wealth of information in a relatively small amount of space. In each case, be it instrument, spacecraft, or mission, one has the impression that details of internal design reviews are being summarized. Since such specifics are presented for more than 500 topical entries, the sheer quantity of information is awesome. These tables are supplemented by 522 figures that include instrument and spacecraft layouts, and in some cases, diagrams that explain the inner workings of selected instruments.

The work includes more than 2000 references, most of which have appeared in the last five years. References are presented as footnotes on the page where they are cited, which is a thoughtful gesture for the reader, especially in a book more than 5 cm thick.

Unlike previous editions, this volume includes a brief history of Earth observation (Part A) that in 160 pages provides a detailed telescopic view of the field, a review of the basic physics that enable and constrain Earth observation, an introduction to spacecraft systems, overviews of operational meteorological missions, and navigation and orbital issues, among other topics. Initial progress toward international cooperation is outlined and complemented by specifics elsewhere in the book on World Data Centers (WDC), the Committee on Earth Observation Satellites (CEOS), and national agencies. As in previous editions, the section on reference data and definitions (Part O) offers concise descriptions of most classes of sensors. The excellent and timely review of orbit options for single- and multiple-satellite systems includes a description of the "cartwheel" constellation now in consideration for solid Earth applications using interferometric synthetic aperture radar. The description of over 200 airborne sensors appears in Part P (only on the CD-ROM). The three Appendices include an extensive glossary, a list of acronyms and abbreviations, and a 34-page list of individual sensors, each succinctly defined and cross-referenced to supporting in-text articles.

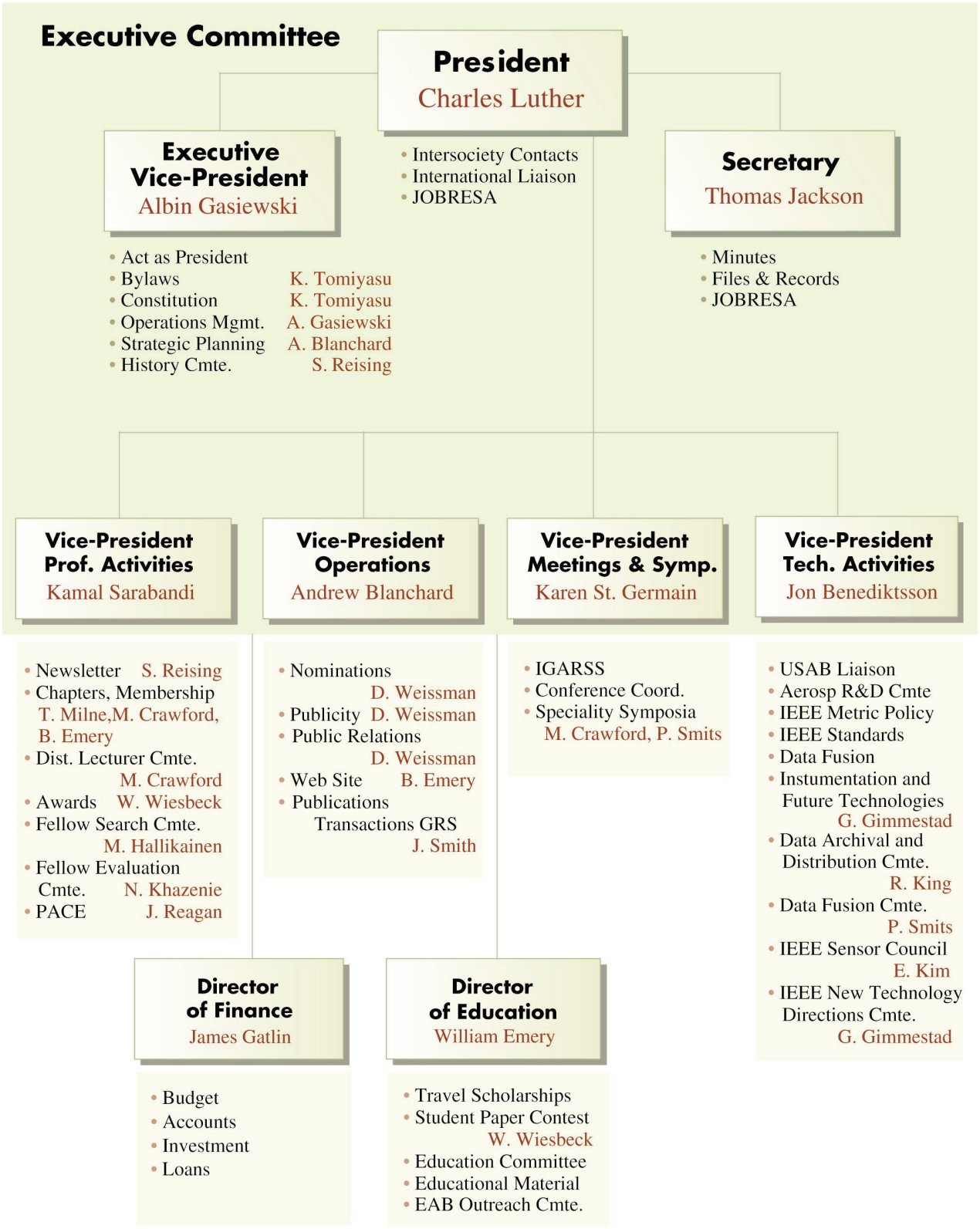
The organization of the book departs from that of its predecessors. Spaceborne missions are grouped according to themes (Parts B through N) selected by Dr. Kramer's own judgment. Whereas this scheme takes some getting used to, with a bit of practice it proves to be very helpful. For example, the TOPEX/Poseidon (T/P) mission, dedicated to investigating dynamic ocean topography with radar altimeters, is found in Part E – Geodynamic/Earth-System Missions – along with only about twenty others that also fit the theme, such as GRACE, GOCE, and CryoSat. That is a far more manageable set than an extensive chronological or alphabetical listing can offer, which these days would run to many hundreds of items, most of which would be irrelevant to a given theme. The four-page T/P discussion provides a detailed summary of the spacecraft and its systems, the primary and supporting payload instruments, the original science objectives, and ten references sufficient to carry the interested reader to the next level. This example is illustrative of all cases that I pursued for which I know the territory. The data provided are accurate, extensive, and up-to-date. Mission themes include commercial satellites, meteorology, Earth monitoring and environment, solar-terrestrial science, and space station-based missions, among others.

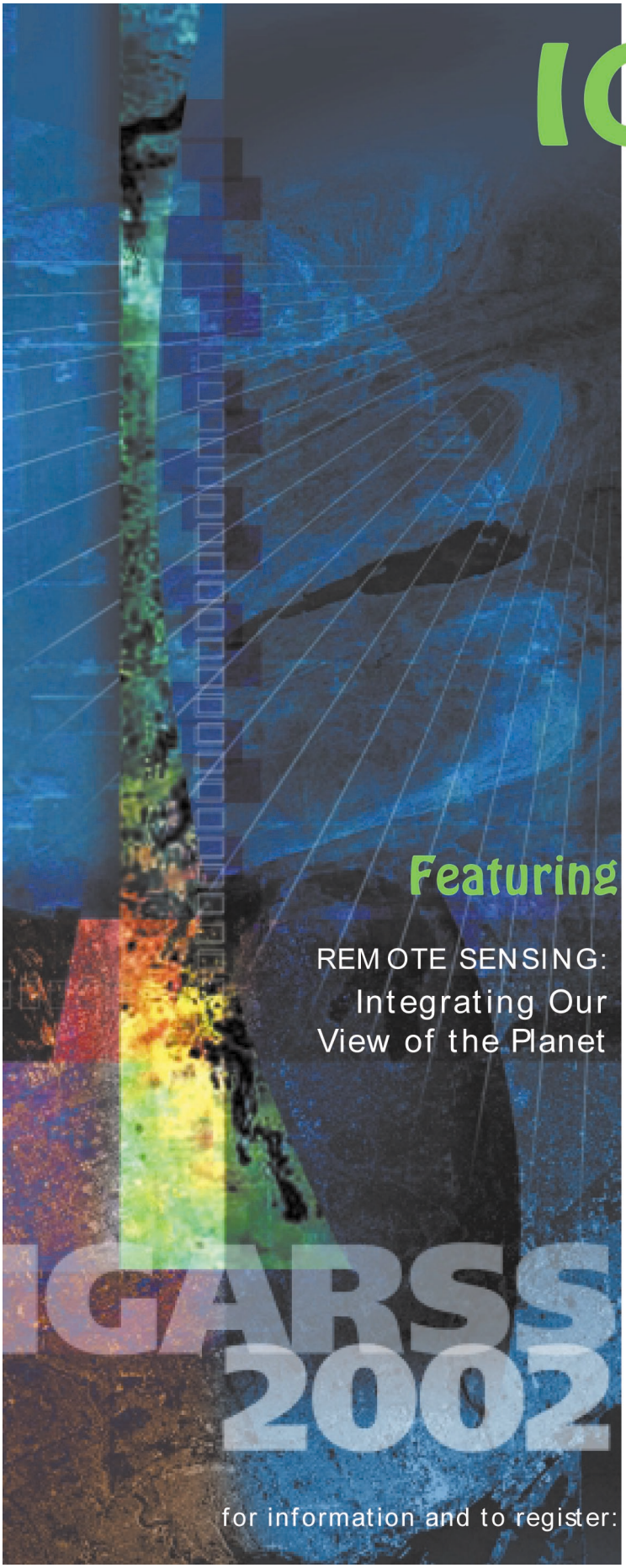
The CD-ROM includes an Adobe Reader™ and search engine. Search capability is new with this Edition, and is invaluable. As a test case, I found several dozen hits throughout the book on "TOPEX." Items that were found include: KITSAT-1, which in 1992 shared the launch with T/P; DORIS and GPS navigation; major measurement missions such as WOCE (World Ocean Circulation Experiment); a description of the three-frequency microwave radiometer that is part of the T/P payload; and the Jason-1/TOPEX tandem mission, among others. Keyword searches also find reference citations, which is a valuable tool in its own right.

Dr. Kramer graciously acknowledges the more than 500 individuals who provided project information for this edition. It is clear that the author has invested an incredible amount of effort to compile so much rich detail in such an accessible format and pleasing style. There is no alternative reference to be found anywhere that approaches the scope and depth of this modern classic.

Dr. R. Keith Raney
Johns Hopkins Univ. Applied Physics Lab
Space Dept., Johns Hopkins Rd.
Laurel, MD 20723 6099
E Mail: keith.raney@jhuapl.edu

IEEE Geoscience and Remote Sensing Society Administrative Committee Organization 2002





IGARSS 2002

2002 IEEE International Geoscience and Remote Sensing Symposium

jointly held with the

24th Canadian Symposium on Remote Sensing

24-28 June 2002

Westin Harbour Castle Toronto Canada

Featuring an expanded tradeshow!

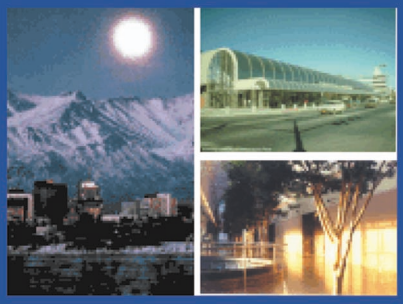
The first 100 qualified applicants receive a complimentary one-year IEEE GRSS membership
Visit the IEEE GRSS booth for more information.

Early Registration Deadline: 10May 2002

www.igarss02.ca

IEEE INTERNATIONAL GEOSCIENCE AND REMOTE SENSING SYMPOSIUM

— IGARSS —



FUTURE SYMPOSIA LOCATIONS

IGARSS'02

24-28 June 2002 • Toronto Canada
Westin Harbour Castle
Ellsworth LeDrew, University of Waterloo
General Chairman (ells@watleo.uwaterloo.ca)

See advertisement and reg form in this publication.
Early registration deadline: 10 May 2002.

IGARSS'03

21-25 July 2003 • Toulouse France
Pierre Baudis Congress Centre
Didier Massonet, CNES
General Chairman (didier.massonnet@cst.cnes.fr)

IGARSS'04

20-24 September 2004 • Anchorage Alaska
William A. Egan Convention Center
Verne Kaupp, University of Missouri-Columbia
General Chairman (KauppV@missouri.edu)

IGARSS'05

Date Pending • Seoul Korea
COEX Convention and Exhibition Center
Wooil Moon, Seoul National University, Seoul Korea
General Chairman (wmoon@eos1.snu.ac.kr)

IGARSS'06.

24-28 July 2006 • Denver Colorado USA
Colorado Convention Center
A.J. Gasiewski, NOAA (al.gasiewski@noaa.gov)
and V. Chandrasekar, Colorado State University
(chandra@engr.colostate.edu)
General Co-Chairmen

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ANNOUNCEMENT

The *Second International Microwave Radiometer Calibration Workshop*
(µCal 2002)
and
Meeting of the Conference on Earth Observation Satellites - Calibration and Validation Subgroup on Microwave Sensors
(CEOS WGCV Microwave Sensors)

will be held on
9-11 October 2002
at the
Universitat Politècnica de Catalunya (UPC)
Barcelona, Spain.

The joint µCal 2002 and CEOS WGCV Microwave Sensors workshop is focused on microwave radiometer calibration and design. The workshop will be conducted as a single forum of serial oral sessions. Posters presentations and commercial and sponsor exhibits will be displayed throughout the workshop. The microwave radiometer community is invited to participate in this meeting and present new research results on the following topics:

- calibration requirements and error budget analysis,
- standard terminology and techniques,
- applications demanding improved calibration,
- calibration reference design and analysis,
- calibration facilities,
- design and calibration of:
  - polarimeters,
  - real aperture systems,
  - synthetic aperture systems,
  - interferometers,
  - airborne, spaceborne and ground-based sensors,
- calibration/validation of spaceborne sensors using airborne or other vicarious calibrations.

Registration information is available on the conference web site:
www.ope-uex.com/ucal02_ceos

Schedule:
First Announcement - April 1
Second Announcement – June 24
Abstracts Due – July 15 (500-word PDF file)
Notification of Speakers – July 27

Call for Comments on Geographic Information Standards

The Data Archival and Distribution Technical Committee, in conjunction with the Data Fusion Technical Committee, is coordinating comments from the IEEE Geoscience and Remote Sensing Society on the standards development of ISO TC 211 Geographic Information/Geomatics. The makeup, scope, and other details of TC 211 can be found at http://www.isotc211.org/. At present there are two draft standards available for comment. These are DIS 19109, "Geographic Information - Rules for application schema" and DIS 19119, "Geographic Information – Services". The scope of the "Rules for application schema" standard is the definition of the rules for defining an application schema, including the principles for classification of geographic objects and their relationships to an application schema. The scope for the "Services" standard is the identification and definition of the service interfaces used for geographic information and definition of the relationship to the Open Systems Environment model. The procedure for obtaining copies of the draft standards is posted at http://www.dfc-grss.org/standards.html.

Draft comments must be forwarded to ISO through IEEE GRS-S by 24 June 2002. Therefore, to permit adequate time to consolidate the society's comments, anyone interested in making comments is asked to send them to the Chair of the Data Archival and Distribution Technical Committee by 14 June 2002. Please send comments, along with your name, organization, and IEEE membership number to:

Dr. Roger L. King
Chair, Data Archival and Distribution
Technical Committee
Computational Geospatial Technologies Center
Box 9627
Mississippi State University
Mississippi State, MS 39762-9627 USA
Phone: 662-325-2168
Fax: 662-325-7692
E-mail: rking@ece.msstate.edu

President's Message

continued from page 4

tured on the cover of this Newsletter, to fully appreciate the urgency of this problem. A pertinent question for our Society is—considering prevailing threats from conventional, and increasingly, from nuclear, biological and chemical terrorism—can we better position our Society to focus more specifically on research issues that might lead to the development of systems, techniques or methodologies for detecting or minimizing such threats? Our Society is particularly well suited to grapple with such difficult issues, and I expressly invite your ideas/suggestions regarding how we might contribute to this effort.

As you are aware, our Society's budget, as well as the budgets of all IEEE Societies, has been under siege for the past two years due to unrealistic revenue expectations built into the IEEE budget by IEEE Headquarters, resulting in budget deficits of huge proportions. Significant drawdowns of our Society's revenues by the IEEE parent organization have been made to address these deficits. These drawdowns on our reserves are severely impeding our efforts to start new initiatives required to effectively pursue the goals and objectives of the Society. Significant pressure is being put on the IEEE Headquarters to reform the budgeting process.

Despite these difficulties, my goal remains: To Make the Best, Better. However, I will need to enlist your help in this process. Briefly, a few ways that you can help are:

1. Join the campaign to increase membership by enlisting a friend/colleague to join our premier organization. This alone can have a tremendous impact on our membership.
2. Join and participate in one of the Society's dynamic Technical Committees. Visit the Society's web site (http://ewh.ieee.org/soc/grss) for details.
3. Attend the Annual IGARSS Symposia and share the latest results from your Remote Sensing research, or contribute to discussions regarding future directions for the international Remote Sensing community. IGARSS '02 will be held in Toronto, Canada, at the Westin Harbour Castle Hotel and Conference Center, an excellent venue on the shores of Lake Ontario. It features an outstanding Technical Program encompassing several new topics, and a Social Program designed to show off the city's many fine attributes.

I thank you in advance for your interest, enthusiasm, and support; all of which are critical to making my term as president a success. I look forward to meeting you personally at IGARSS'02.

Charles A. Luther
GRS-S President

UPCOMING CONFERENCES

See also **http://www.techexpo.com/events** or **http://www.papersinvited.com** for more conference listings.

Name: **Ninth International Conference on Ground Penetrating Radar (GPR)**
Dates: April 29 – May 2, 2002
Location: Santa Barbara, California
Contact: Dr. Hua Lee
Dept. of Electrical and Computer Engineering
University of California, Santa Barbara
Santa Barbara, CA 93106 USA
Fax: +1-805-893-3262
Email: gpr2002@nv.doe.gov
URL: http://www.ece.ucsb.edu/gpr2002

Name: **EUSAR 2002: 4th European Conference on Synthetic Aperture Radar**
Dates: June 4-6, 2002
Location: Cologne (Köln), Germany
Contact: Dr. K. Krücker
FFM-FGAN, Neuenahrer Str. 20
D-53343 Wachtberg, Germany
Phone: +49-228-9435-226
Fax: +49-228-9435-627
Email: eusar2002@fgan.de
URL: http://www.fhr.fgan.de/eusar

Name: **Third International Symposium on Remote Sensing of Urban Areas**
Dates: June 11-13, 2002
Location: Istanbul, Turkey
Contact: Prof. Filiz Sunar Erbek, Symposium Secretariat
Istanbul Technical University
Maslak, Istanbul 80626, Turkey
Email: fsunar@srv.ins.itu.edu.tr
URL: http://www.ins.itu.edu.tr/rsurban3

Name: **2002 IEEE AP/S International Symposium and USNC/URSI National Radio Science Meeting**
Dates: June 16-21, 2002
Location: San Antonio, Texas
Contact: Prof. Robert Nevels
Department of Electrical Engineering
Texas A&M University
College Station, TX 77843 USA
Email: nevels@ee.tamu.edu
URL: http://www.ieeeaps.org/2002APSURSI

Name: **PIERS 2002: Progress in Electromagnetic Research Symposium**
Dates: July 1-5, 2002
Location: Cambridge, Massachusetts
Contact: Professor J. A. Kong
Room 26-305, 77 Massachusetts Avenue
Cambridge, MA 02139 USA
Tel: 617-258-9525
Fax: 617-258-8766
Email: piers@ewt.mit.edu, kong@mit.edu
URL: http://www.piers.org

Name: **6th WSES/IEEE Multiconference on Circuits, Systems, Communications and Computers (CSCC 2002)**
Dates: July 7-14, 2002
Location: Rethymna Beach, Crete Island, Greece
Contact: Prof. Nikos Mastorakis
Phone: +00301-458-1370
Email: cscc@worldses.org
URL: http://www.softlab.ntua.gr/~mastor/cscc02.htm

The Institute of Electrical and Electronics Engineers, Inc.
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331