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IEEE

# GEOSCIENCE *and* REMOTE SENSING

*Newsletter*



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Editor: David Kunkee



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Month	June	Sept	Dec	March
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It is my pleasure to introduce this 'very full' issue of the GRS-S Newsletter. This year for the Newsletter, we have decided to split up reports from IGARSS'07 into two parts. The first part appears in this issue and reports on plenary activities, including opening remarks, presentation of the IEEE Major Awards, IEEE Fellow's recognition, and presentations from distinguished guests at the Plenary. The second part, which will appear in the December Newsletter, will include an overall conference report and cover the GRS-S paper awards presented at the Thursday evening banquet. And finally, it is worthy to note this year, for the first time, the IGARSS plenary activities were web-cast, providing a new level of access and recognition to the conference. As in the past, Prof. Werner Wiesbeck provides an excellent and timely write up of the day's events!

In the June Newsletter, Dr. Leung Tsang announced the approval of a new GRS-S sponsored refereed publication, the Journal of Selected Topics in Applied Earth Observation and

Remote Sensing (IEEE J-STARS). In this issue, we provide a feature article that describes the formation of this new journal by Dr. Ellsworth LeDrew, Editor and Dr. Kun-Shan Chen, Deputy Editor, of IEEE J-STARS.

In the Chapter's corner for this issue, Dr. Linda Hayden, president of the Eastern North Carolina Chapter, provides an overview of this very active GRS-S Chapter that was organized in 2003 on the campus of the Elizabeth City State University in North Carolina.

The Data Fusion Technical Committee has provided a report of their 2005 – 2007 activities. This report describes their very successful data fusion contests and recent special sessions at IGARSS. The DFTC has been very active in their outreach, developing tutorials on data fusion, the DFTC website and newsletter.

Also in this issue, an industrial profile is provided by Dr. Fritz Bien President, and Dr. Robert Sundberg, Vice President for Technology Development of Spectral Sciences Inc. in Burlington, MA, a small company specializing in technology development and research in optics and related fields. Their products related to atmospheric science may be familiar to many of you.

One of the best parts of IGARSS is meeting new participants, renewing friendships and listening to the many activities going on in remote sensing today. In the absence of an exciting venue such as IGARSS to perform this function, we have...the GRSS Newsletter. Whereas the Newsletter may be a poor substitute for a good face-to-face meeting, we can hope to provide interesting material on the activities and people involved in remote sensing, and that's where we need your help. If you have contributions to the Newsletter, please do not hesitate to contact me or any of the Associate Editors. Many thanks!

## President's Message



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IGARSS 2007 has concluded with major success. The number of registrants totaled more than 1500. I would like to thank Professors Ignasi Corbelló, Adriano Camps and the IGARSS '07 Organizing and Technical Committees, for putting together an excellent program that addresses the theme "Understanding and

Sensing our Planet". We had distinguished plenary speakers who made thoughtful and insightful presentations. The technical sessions had excellent presentations and the papers were of high quality. There were few no shows in the oral sessions. Of the approximately 60 papers that I listened to, the presentation rate was about 85%. Also the proximity of the session rooms facilitates going from one room to another to attend different presentations. During the poster sessions, the authors were at the posters to explain their papers and answer questions. I congratulate the organization team on their plans and the execution of the plans

The social program was excellent. The ice breaker, reception, concert, tours and the banquet were all very well attended. For the Technical Committee dinner, all the tickets were sold. I was barely able to have bought the last ticket.

The past year has been a successful year for Remote Sensing. In Europe, the new radar satellite TerraSAR-X was launched in June. The images have been returned and have the 1 meter reso-

*(continued on page 4)*

**Cover Information:** Cover photo for the first issue of the IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (IEEE J-STARS), emphasizing Earth Observations and Renewable Wind Energy. See page 19. Photo: Rows of wind turbines, Altamont, CA, USA.



*(President's Message continued from page 3)*

lution. The data will be used for Landcover mapping, forest cover monitoring, crop type mapping. In Japan, ALOS was launched in January 2006. After 1 year and 6 months, the satellite is still collecting data and has instilled tremendous confidence in JAXA's satellite program. ALOS has three sensors: (PRISM) to precisely measure land elevation, AVNIR-2 to observe land surfaces, and the Phased Array type L-band Synthetic Aperture Radar (PALSAR). The PALSAR has returned some very useful data of the Indonesian flood. In China, the weather satellite Fengyun-4 will be launched shortly. In Chinese, "Feng" means wind and "Yun" means cloud. In Canada, the RADARSAT II will soon be launched. In US, after several years of study, the Committee on Earth Science and Applications has completed the Decadal Report. The Committee calls for a renewed commitment from the US Administration to earth observations to secure benefits for mankind. The report gave a large boost to the US satellites program as it recommended NOAA to restore key observational capabilities of satellite missions and also NASA and NOAA to launch 17 new satellite missions in the next 10 years. For example, although CMIS of NPOESS was previously cancelled, now a new microwave instrument MIS is planned. For soil moisture, the previous Hydros mission was cancelled. However, it is now to be restored under a different name SMAP. These recent remote sensing accomplishments in Europe, Asia and North America all result from your hard work. I congratulate you on your success.

For the Geoscience and Remote Sensing Society, we have a firm commitment to excellence. Our vision is to be the leading society in science, engineering, applications, and education for the remote sensing and the geoinformation community. The goals are to be the most recognized in our fields of interest and be the global information resource for remote sensing.

To achieve these goals, we have to excel in our journals, conferences and global outreach. The following are some action items.

In journals, GRSS recognized the increasing importance of GEOSS and earth observations applications. In collaboration with ICEO, we have jointly proposed a new journal: Journal of Selected Topics in Applied Earth Observations and Remote Sensing. The proposal was approved by the IEEE Technical Activities Board in June 2007. The first issue will appear in 2008. I urge you to subscribe to the new journal and also contribute by submitting your papers to the new journal. IEEE Transaction on Geoscience and Remote Sensing, the flagship journal of GRSS is a premier journal. It published 3600 pages last year. The impact factor has moved up. The Geoscience and Remote Sensing Letters (GRSL) journal is making significant progress. We will increase the number of pages by 50% to 600 pages. The GRSL was invited by the Company Thomson to be on the fast track for ISI. Thus the impact factor of GRSL will be available shortly. We will continue to improve the journals, the timeliness, the impact

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<b>Region 2: Eastern USA</b>			
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<b>Region 3: Southeastern USA</b>			
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<b>Region 4: Central USA</b>			
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<b>Region 5: Southwestern USA</b>			
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<b>Region 7: Canada</b>			
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Ukraine Section	AP, NPS, AES, ED, MTT, GRS EMB	Anatoly Kirilenko	kirilenko@ire.kharkov.ua
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## GRS-S MEMBERS HIGHLIGHTS

### GRS-S MEMBERS ELEVATED TO THE GRADE OF SENIOR MEMBER IN JUNE 2007

William Anselm  
William Gail  
Maurico George Miguel Jardim

Annapolis Sub Section  
Denver Section  
Brazil Section

Senior membership has the following distinct benefits:

- The professional recognition of your peers for technical and professional excellence.
- An attractive fine wood and bronze engraved Senior Member plaque to proudly display.
- Up to \$25.00 gift certificate toward one new Society membership.
- A letter of commendation to your employer on the achievement of Senior Member grade (upon the request of the newly elected Senior Member).

- Announcement of elevation in Section/Society and/or local newsletters, newspapers and notices.
  - Eligibility to hold executive IEEE volunteer positions.
  - Can serve as Reference for Senior Member applicants.
  - Invited to be on the panel to review Senior Member applications.
  - Eligible for election to be an IEEE Fellow
- Applications for senior membership can be obtained from IEEE GRS-S website: <http://ewh.ieee.org/soc/grss/> (click Join Us) or IEEE Senior membership program: <http://www.ieee.org/organizations/rab/md/smprogram.html>

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## GRS-S CHAPTER'S CORNER

### IEEE-GEOSCIENCE AND REMOTE SENSING SOCIETY EASTERN NC CHAPTER

Linda Hayden, President  
Elizabeth City State University  
Email: [HAYDENL@MINDSPRING.COM](mailto:HAYDENL@MINDSPRING.COM)  
<http://nia.ecsu.edu/ieee/index.html>

#### THE BEGINNING

The first meeting of the Eastern North Carolina Chapter of the IEEE-GRSS was held on 13 November, 2003 in the Center of Excellence for Remote Sensing Education and Research (CERSER) on the campus of Elizabeth City State University. The chapter's distinguished lecturer series was initiated with Dr. Sonia Gallegos, from the Naval Research Laboratory at Stennis Space Center. Her talk was entitled, "Optical Models Developed for the Yellow Sea Between the Coasts of China and the Korean Peninsula". More than 100 members and guests were in attendance, including Mr. Charles Luther, past IEEE GRS-S president, and Mr. James Harrington, Director of the MU-SPIN Office at NASA Goddard Space Flight Center. The meeting was a three-day event that included a webcast and lecture by Dr. Gallegos, two sessions of remote sensing application software training, one led by Dr. Mohamed Kolam, and another by Dr. Palaniappan, as well as several other activities.



*Mr. Charles Luther, Dr. Sonia Gallegos, Dr. Linda Hayden, IEEE GRS Chapter President, Mr. James Harrington (left to right).*

#### THE GOALS

Housed on the campus of a historically Black University, the chapter addresses the need to increase the involvement of underrepresented minority faculty, students and researchers in remote sensing, GIS and satellite imagery applications.



Activities of the chapter provide support for the research interest of its membership while advancing science and technology in geoscience, remote sensing and related fields.

The goals of the chapter are aligned with those of the GRS society seeking to advance the field of geoscience and remote sensing through scientific, technical and educational activities. The Society strives to promote a high level of technical excellence among its members by exchange of information through conferences, meetings, workshops, publications, and through its committees to provide for the needs of its members.

### THE EXECUTIVE COMMITTEE

An executive committee was established with a consensus for one year terms during the second meeting. For the 2006-2007 term the following members were elected: Dr. Linda Hayden, President; Dr. William Porter, Vice-President; Mrs. Keisha Wilkins, Secretary/Treasurer; Mrs. Elizabeth Noble, Membership Campaign.

### ACTIVITIES

Activities of the chapter through the end of 2007 are briefly summarized below. Highlights from each event can be viewed at <http://nia.ecsu.edu/ieee/index.html>.

### Seminars

- Dr. Sonia Gallegos, “Optical Models Developed for the Yellow Sea Between the Coasts of China and the Korean Peninsula”, March 4-6, 2003.
- Dr. Malcolm LeCompte, “Views and Visualization of Earth From Space”, November 12-14, 2003.
- Dr. Sivaprasad Gogineni, “Microwave Remote Sensing and Applications”, November 12-14, 2003.
- Dr. Keith Raney, “Mapping Sea Bottom Topography with Radar Altimetry from Space”, March, 2004.
- Dr. Glenn Prescott, “Polar Research and Remote Sensing Education and Research Opportunities, October 8, 2004.
- Dr. Phil Dunstan, “Remote Sensing of Coral Reefs and Change Detection”, November 18, 2004.
- Dr. Scott Hensley, “Mapping the World’s Topography from Space – The Shuttle Radar Topography Mission”, March 3, 2005.
- Dr. Janet Campbell, “Ocean Color Remote Sensing”, November 10, 2005.
- Dr. Ken Jezek, “Antarctica: Its Ice, Land and Ocean as viewed by RADARSAT-1”, March 7, 2006.
- Dr. Robert McCoy, “New Low-cost Microsatellite Initiatives at ONR”, July 19-20, 2006.
- Dr. Geoffrey Fox, “Implementation of a Polar Science TeraGrid Gateway for SAR and other CReSIS Data Sets”, October 19, 2006.
- Dr. Robert Bindshadler, “Understanding the West Antarctic Ice Sheet from Space: Beyond Dogsleds and Frozen Toes”, March 20, 2007.

- Dr. Ali Omar, “Career Opportunities in the Geosciences”, July 13, 2007.



### Conference Participation

The chapter has provided support for representatives to attend the annual international symposium IGARSS to hear reports on the recent advances in remote sensing and to report on their research activities. Representatives have attended the IGARSS’03 in Toulouse France, IGARSS’04 in Anchorage Alaska, IGARSS’05 in Seoul, Korea, IGARSS’06 in Denver, Colorado and IGARSS’07 in Barcelona, Spain.

Dr. William Porter, Chapter Vice President serves as representative to North Carolina IEEE ExCom and to the IEEE-USA events. Dr. Porter participated in the 2006 IEEE-USA Leadership Workshop held March 3-5, 2006 in St. Louis, Missouri. The goals of this workshop were to build understanding of the IEEE and IEEE-USA mission, vision, and goals and to provide background for various tasks such as recruiting, professional development, and training volunteers.

During this workshop an Awards Ceremony was held to honor IEEE-USA award recipients for their professionalism and technical achievements, as well as literary contributions to public awareness and understanding of the engineering profession in the United States. Dr. Linda B. Hayden, chapter president and director of The Center of Excellence in Remote Sensing and Research at Elizabeth City State University, was awarded the Professional Achievement Award for outstanding accomplishments in cultivating student interests in engineering and supporting career development. Highlights from the event can be viewed at <http://nia.ecsu.edu/ieee/events/060304ieeeeusa/ieeeeusa06.htm>.

### Workshops

Because education is a major objective of GRSS, the chapter sponsors workshops and training events for its membership to ensure their awareness of remote sensing technologies and tools. Some of the training events supported by the chapter include:

- EARTH: Pixoneer Software for Remote Sensing Education,



Participants in the Chapter meeting and Stella Software Training held on March 19, 2007.

Dr. Mohamed Mohamed, March 5, 2003.

- Organization and Visualization of Large Datasets in Remote Sensing Digital Libraries. Kolam Remote Sensing Visualization Software, Dr. K. Palaniappan and Joshua Fraser, March 5, 2003.
- GIS-Arcview Training with Dr. Chunlei Fan 18-19 May,

2004.

- Utilize Census 2000 datasets. The workshop was hosted by Mr. Anthony Fairfax, a Geodemographic Consultant with Census Channel. Ms. Julie Stamper of the Pasquotank County GIS office also provided a session on the use of local GIS and census data for formulating local interactive maps. Sept. 27, 2004.
- Use of ERDAS to extract data from satellite images or aerial photography. Workshop Leader were Ms. DeNeice Guest and Ms. Jennifer Aitken from Stennis Space Center. October 17 and 18, 2005.
- SAV Work Group training for state and federal natural resource managers March 15, 2006.
- Stella Training, Dr. George Hurt and Dr. Cameron Wake, March 19, 2007.

#### THE WEBSITE

The chapter website is located at <http://nia.ecsu.edu/ieee/index.html>. The website provides detailed information on past meetings. An individual website is created for each meeting in order to document details about the speaker, lectures, and activities conducted during the event. In addition, minutes from each meeting can be viewed. Links to the GRSS society and the IEEE Eastern North Carolina Section websites can be found on the chapter website as well.

#### THE FUTURE

A petition has been submitted to IEEE Student Services for the establishment of a student IEEE GRS chapter. This chapter will enable joint meetings between the current chapter and students who are IEEE GRS members.

## GRS-S TECHNICAL COMMITTEES

### ACTIVITIES OF THE DATA FUSION TECHNICAL COMMITTEE DURING THE 2005-2007 TERM

P. Gamba (Chair) and Jocelyn Chanussot (Co-Chair)

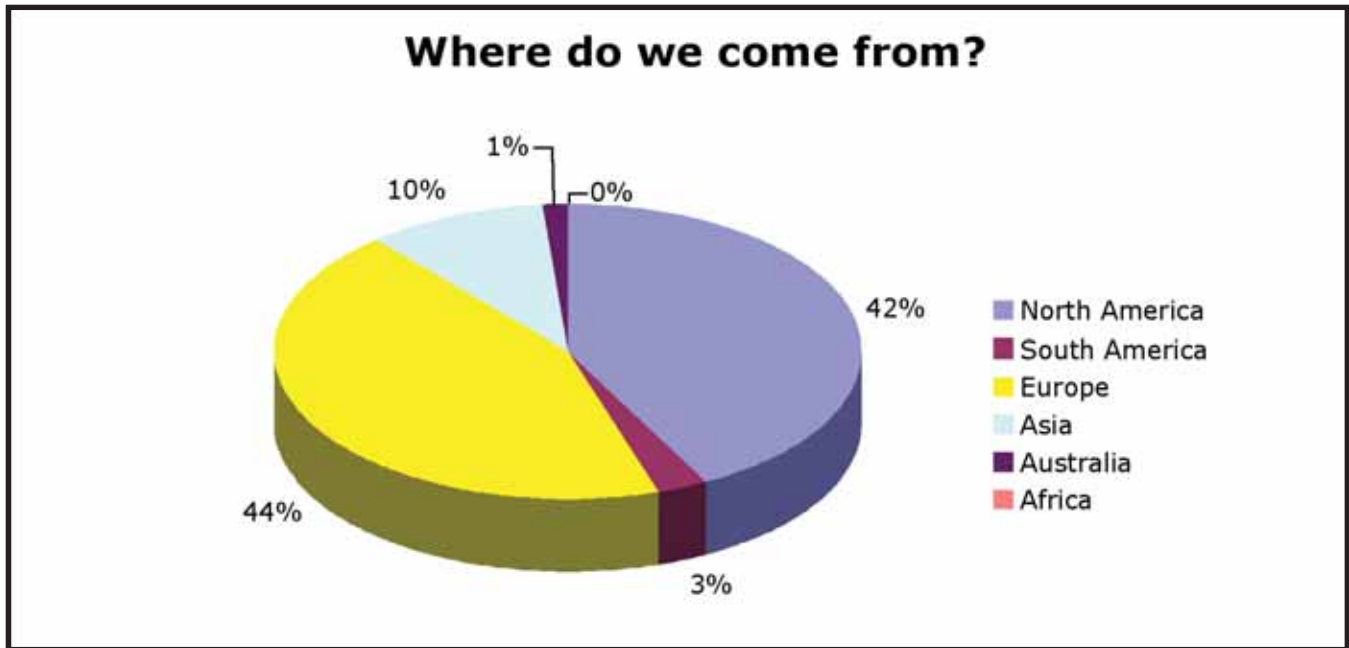
This short report aims at discussing the activities of the Data Fusion Technical Committee by the end of the 2005-2007 term, and in light of the coming elections of the Chair in the coming months. Right at the beginning, we should say that it was really a pleasure to serve in this term; the challenge to do something useful and effective was great, but we hope we were able to match some of the requirements by the data fusion community. In the following we will focus on three aspects of DFTC, i.e., its membership, technical and outreach activities.

#### 1. Membership

The membership of DFTC is quite diverse, both with

respect to the geographical location, age and the working conditions. In particular, there are currently 75 active members, out of 128 subscriptions to the committee's electronic mailing list. There has been a very recent survey to define these and the following numbers, which thus could be considered as up to date.

The following two graphs show the working condition and geographic location of the active members. According to our data, the majority of the members come from North America and Europe, and there is definitely the possibility to increase the numbers for South America and Africa. This is a clear priority line, in our opinion, for the future of DFTC (and GRSS also). This is also the reason for



some of the recent actions of the Committee, as explained in the final part of this article.

Another interesting point comes from the second graph, which shows that almost 3/4 of the total active members come from academia. Moreover, the student percentage, which is 10%, is quite low. We are attracting young members for sure, especially by means of the free data sets that we are increasingly offering for testing and benchmarking purposes. Nonetheless, the student number is not as large as we would like, and they often do not maintain their membership after graduation. This is another priority for the future, and it requires us to define clearly which are the advantages of a longer membership to DFTC. Again, this is part of a wider problem, affecting GRSS as a whole.

## 2. Technical activities

The technical activities of DFTC refer mostly to the management and enrichment of the committee's data sets, for comparison and benchmarking of data fusion algorithms, and the organization of the annual Data Fusion Contest, in conjunction with the Data Fusion Special Session at each IGARSS conference.

### 2.1 DFTC data repository

The collection of data sets for benchmarking and algorithm comparison was really one of the outstanding portions of the legacy by Paul Smits, former DFTC Chair. This collection had already 11 very useful data sets. During this term, it was enlarged by looking for and signing collaboration agreements with other groups of scientists working on the same subject and belonging to other

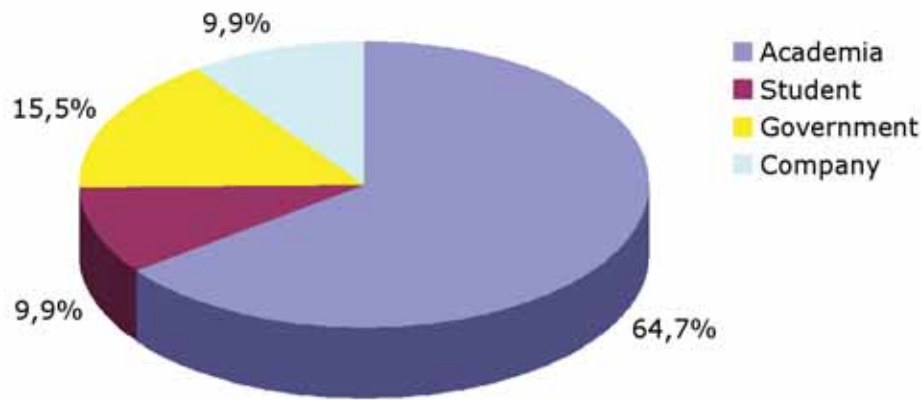
scientific organizations. There are many of them in the data fusion area, addressing this field from many different points of view.

The first step in this direction was achieved when a Memorandum of Understanding (MoU) between DFTC and Technical Committee 7 "Remote Sensing" of the International Association for Pattern Recognition (IAPR) was signed on November 2nd, 2005. This MoU allows exchanges of data sets and algorithms between the two committees. In particular, it provides to DFTC members the access to the data sets listed on IAPR TC7 web page (<http://www.iapr-tc7.org>). Of particular interest are Hyperspectral data, kindly provided by the University of Rennes, Multitemporal ERS data, hyperspectral data (DAIS and ROSIS) and VHR data (EROS satellite) provided by the University of Pavia, and a photogrammetric pair, for DEM and DTM extraction, provided by the Technical University of Jerusalem.

Similarly, another agreement was informally discussed by the DFTC Chair with members of the International Society for Photogrammetry and Remote Sensing (ISPRS) Governing Board and GRSS AdCom. After some e-mail exchanges, it turned out that a general agreement between ISPRS and GRSS was already signed a few years ago. According to this MoU, there is the possibility to share data and other information between GRSS technical committees and ISPRS working groups. Therefore, DFTC data sets will be made available to ISPRS members. In exchange, ISPRS data sets, currently freely available at <http://www.isprs.org/data/index.html>, will be very soon



## What's our job?



transferred to a password-protected area, whose access will be granted to DFTC members.

### 2.2 Data Fusion Contest

Starting in 2006, the DFTC organizes a yearly “Data Fusion Contest,” in conjunction with the IGARS Symposium. Focusing every year on one specific application, the basic idea consists in distributing some data sets to the participants, specifying one specific goal. Every participating team is then allowed a few weeks to apply its algorithms and send the corresponding results back to the organizers. All the results are then evaluated using standard metrics and a comparison aiming at underlining every algorithm’s specific merits is presented during the data fusion special session at the following IGARSS. Eventually, the most meriting teams / algorithms are rewarded and receive an IEEE Certificate of Recognition. The central idea of the contest is to stimulate activity among the - already very active - data fusion community in remote sensing. Furthermore, though of the utmost importance, comparing different methods in a fair way is quite a difficult task:

- An objective comparison can only be achieved by using common data sets. Whereas authors are traditionally not allowed to further distribute the data sets on which their publications are based, the organization of the contest allows data sets to be shared, thus providing a common reference.
- Actually coding someone else’s algorithm to exactly reproduce the corresponding results and test the method on other images is, in the best situations, extremely tricky and time-consuming. Most of the

time, even though one can only regret it, this is simply not possible. By asking every participant to apply his or her own algorithm, the contest is solving this problem: every method being applied by its initial inventor, one can be sure that the potentiality of every method is optimally exploited.

The first contest was dedicated to pansharpening, i.e. the fusion of a panchromatic image (high spatial resolution) with a multispectral image (low spatial resolution), the aim being to synthesize a multispectral image with a high spatial resolution. Over 4Gb of data were distributed, with the support from CNES (French Spatial Agency) and the Mississippi State University. In the end, eight different algorithms from seven different teams worldwide have been compared. The evaluation was performed by Lucien Wald, from the Paris School of Mines, involving over 600 values of statistical indices. Two algorithms, clearly outperforming the others, received an IEEE Certificate of Recognition during the TC and Chapter dinner at IGARSS in Denver.

However, there was a very long and harsh discussion after the contest about the assessment methodology. In the end, we felt that it was time to shift gears from simply re-discussing the results of the contest to a more general analysis of the problem of pansharpening. Therefore, any 2006 Contest participant willing to work together was asked to join a newborn “Pansharpening Working Group” of DFTC. All of them agreed, and more discussion arose in the past months. They were invited to enter a dedicated web site where the data sets and the programs related



to the pansharpening test cases used for the Data Fusion Contest in 2006 are placed. The hope was that the data and program sharing would have helped everybody to increase his/her knowledge and slowly but certainly harmonize the different views. The hope is still there, and needs to be checked against reality in the next few months, before a new DFTC Chair is appointed.

Following the success of the 2006 Contest, a new one was organized for 2007. The aim of the 2007 Data Fusion Contest is to check existing methodologies at the research or operational level to solve remote sensing problems using data from different sensors. Thus, the contest was related to urban mapping using radar and optical data. A set of satellite radar and optical images (ERS amplitude data and Landsat multi-spectral data) was made available and the task was to obtain a classified map as accurate as possible with respect to ground truth data, depicting land cover and land use classes for the urban area under test. Results are going to be presented during the Data Fusion Special Session at IGARSS and some details about the best performing algorithms and methodologies were required to be discussed by the authors of the best maps. A more detailed report will be published, presumably in the September or November GRSS Newsletter issue. The Contest team is also considering, according to the novelty of the algorithms proposed by the contest participants, to write a Transaction paper about the contest. However, in order to guarantee the participants and allow them to write their own papers, the uploaded final classification maps will be used only for the contest and will not be made available to the public. The portal for the Data Fusion Contest for 2007 is on-line at <http://tlclab.unipv.it/dftc>, and was designed by Gianluca Pulina, who we thank for this excellent piece of work. It allowed anyone to register, read the contest rules and understand which is the task for next year's contest, download the data and upload the results. It also provides immediate feedback on the quality of the uploaded map by computing a few quantitative indexes and adjourning correspondingly the top ten ranking list. The page was a highly popular hit on our web server, and hopefully improved the visibility of DFTC beyond the usual GRSS (or even IEEE) community.

### 2.3 Data Fusion Special Sessions at IGARSS

The DFTC is traditionally in charge of organizing the Data Fusion special sessions at IGARSS. And, following the tradition, these sessions are extremely successful, both in terms of submissions and in terms of attendance and scientific discussions during the symposium.

In 2006 and in 2007, one and a half sessions were organized, for a total of approximately 15 papers every year. The full session is dedicated to general data fusion issues, while an additional half-session was required to gather all the papers on pansharpening and resolution enhancement

(thus the topic of the first contest).

On a methodological point of view, the focus was mainly on the design of advanced classification methods using :

- spatio-spectral approaches (4 papers)
- Support Vector Machines (3 papers)
- decision fusion (2 papers)

The data used for the presented methods were mostly optical data (approx 15 papers), but radar data are also considered (4 papers), as well as multisource data (radar and optical) (3 papers) and hyperspectral data (2 papers).

The range of applications is wide, the main ones being urban remote sensing (10 papers) and environmental issues (10 papers).

In parallel to these special sessions, numerous Data Fusion related papers also appear in various sessions, such as multisensor analysis, change detection and multi-temporal analysis ... This stresses the importance of the field in our community and its transversal interest.

### 3. Outreach activities

Outreach activities by DFTC included in the past term many different attempts to increase the visibility of the Committee both within and outside GRSS and, generally speaking, IEEE. This resulted in a brand new web site and newsletter, many different publications, and learning material available on the web. More has to be done, but we think that the route has been traced.

#### 3.1 Web site & Newsletter

One of the first tasks in this term was to revitalize the web site and to make connections among the DFTC members stronger. We did not feel this committee to be a "community," but we wanted it to be as close to this definition as possible. Therefore, it was decided to start from the web site (<http://www.dftc-grss-ieee.org>), which had not been updated since 2002. Moreover, all DFTC members were added to a brand new mailing list, intended for dissemination of calls, news and other information of interest to the GRSS data fusion community. The list has been used so far to send to the members a bulletin, initially every 15 days and then every month. Without any doubt, this newsletter was instrumental to collect the information by anyone willing to distribute calls and available positions, and forward them to everyone in the Committee.

After a while, due to the work load of the web site designers, all of them volunteering for this work, the new DFTC web site was put on line in September 2006, with almost all the functionalities one may expect. The web site, developed by Francesco Lovergine (a big 'thank you' to him!) is written in MediaWiki, the same language used for the much more famous Wikipedia. Basically, this means that it is the right instrument for a "community" of people, as DFTC is expected to be. It's a highly flexible (and still ongoing) web site. It can and presumably should be improved. Thus, any sugges-



tions by DFTC members on how to change/ complement/ expand or amend it are highly welcome!

### 3.2 Publications

In terms of scientific production, the DFTC has been very active in supporting Data Fusion related publications. We can list the following items:

- organization of Data Fusion special sessions at IGARSS, as previously described;
- publication of a paper in a past issue of these same GRSS Newsletter presenting the Data Fusion contest;
- publication of a Transactions paper (IEEE TGARS) presenting the scientific conclusions of the contest (to appear in the IGARSS'06 special issue, scheduled for Oct. 2007);
- edition of a Data Fusion special issue of the Transactions. The special issue is already a clear success as the final number of submissions should be between 40 and 50 papers.

### 3.3 Learning material

As written above, the DFTCCT web site was designed to be the recipient of learning material, well connected with the GRSS web site, but also featuring peculiar informa-

tion. While this is not actually true, and needs to be improved in the next months, a first step in this direction was the realization of a data fusion tutorial in Spanish. This tutorial now available via both web sites, is a broad introduction to the topic of Data Fusion, with a few examples coming out from urban remote sensing. In other words, it explains what "data fusion" is, and the levels of data fusion that might be applied to remotely sensed data in a rather introductory but comprehensive way. After defining the theoretical foundations of the topic, for each level the tutorial goes on analyzing in detail a few real world examples of applications. As stated in the very first slide, most of the presentation was prepared by Paul Smits. Paolo Ggamba added a few more examples and in the end it was translated from English to Spanish.

### 4. Conclusions

DFTC is a very active technical committee. The challenge to match the expectations of its members was a difficult one. We hope we met it. As a matter of fact, we were really happy to serve as Chair and Co-Chair of DFTC in this term. We learned a lot and enjoyed very much the last two years. Arrivederci and au revoir to everybody!

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*(President's Message continued from page 4)*

factor, and the quality of papers.

We want to publish the best papers in our fields, and we want to attract and retain the best scientists for membership in our society. For example, GRSS is recognized to be the best in SAR technology in remote sensing. We have 4 award recipients at the IGARSS'07 plenary session that are foremost SAR experts. I congratulate Alberto Moreira, for receiving the 2007 IEEE Kiyo Tomiyasu Award. Dr Moreira is internationally recognized for SAR imaging, tomography, SAR data processing and SAR systems. I congratulate Dr. Keith Raney for receiving the 2007 IEEE Dennis J. Picard Medal for Radar Technologies and Applications. He is a leader in the RADARSAT mission and a foremost expert on the physics, design and signal processing of Synthetic Aperture Radar. One of his papers in the Transactions: Precision SAR processing using chirp scaling, has received wide citations. Professor Giorgio Franceschetti receives the IEEE GRSS Distinguished Achievement Award. He wrote a book on SAR Processing. He is known for developing robust phase unwrapping technique. Professor Eric Pottier receives the Education Award. He is well known for his work in SAR image processing and radar polarimetry. He has graduated more than 50 research students, an important asset for GRSS' goal in education. Our goal is to be the best in our field, such as in SAR, as well as in all other areas of remote sensing.

In Conferences, our goal is that IGARSS to become the premier conference. We will take major steps to reduce no-shows. We count on your help to do this. Recently several IEEE conferences received approval from the Company Thomson to have

their Conference Proceedings be included in the citation index. The ADCOM will consider that also for the IGARSS Proceedings. Joining the citation index can potentially move IGARSS to the next level. Secondly, we continue to promote Specialty Conferences. We co-sponsor more than 10 specialty conferences per year. Our next efforts are to put all these specialty conference Proceedings on the IEEE X'plore. This is consistent with our goal of disseminating the most recently updated technological advances on remote sensing through the X'plore because we are the global information resources center in remote sensing.

In global outreach, we are doing at least three things. First: we will continue to hold IGARSS outside North America. Besides holding IGARSS 2007 in Barcelona, Spain, we will hold IGARSS 2009 in Cape Town, South Africa. In 2011 and 2013, we will have IGARSS in Sendai, Japan and Melbourne, Australia, respectively. Second: we have established 3 regional liaisons: Latin American liaison, African liaison and Asian liaison. The purpose of the liaisons is for GRSS to be engaged with remote sensing activities in these three continents. Third: we continue global outreach in partnership with ICEO on GEOSS in global earth observations. Many of GRSS members are helping with GEOSS activities. GRSS members are serving as chairs of GEO committees such as architecture, standards, best practices, user interface, energy, technology, capacity building, etc.

The success of the GRSS in Publications, Conferences, Global Outreach depend on you, your efforts and the efforts of the GRSS ADCOM. Let us continue to work hard for GRSS!



## INDUSTRIAL PROFILE

### SPECTRAL SCIENCES, INC.

Dr. Fritz Bien, President

Dr. Robert Sundberg, Vice President for Technology Development

4 Fourth Avenue, Burlington, MA, 01803 USA

www.spectral.com

#### Introduction

Spectral Sciences, Inc. (SSI) is a small private research and development company dedicated to solving technical and scientific problems from concept to prototype. Since its founding in 1981, SSI has performed basic and applied research and technology development in optics and related fields, including remote sensing, rocket and aircraft optical signatures, ground- and space-based experiment planning and data analysis, atmospheric studies, gas analysis instrumentation, and laser applications. SSI has developed industry-standard scientific computer codes, such as MODTRAN, as well as unique instrument prototypes that have advanced cutting-edge technologies for Government and industry. SSI employs 30 full-time scientists (including 28 at the Ph.D. level) with expertise in Physical Chemistry, Physics, Engineering Physics, Applied Mathematics, Optical Science, and Computer Science.

Areas of SSI's expertise include:

- **Computer Software Development for Spectroscopy and Remote Sensing** -- SSI scientists are authors of widely recognized US DoD computer codes for modeling atmospheric and space environments at infrared, visible, and ultraviolet wavelengths. SSI is actively involved in the development of algorithms and software for the removal of atmospheric effects from remote spectral imagery of the Earth's surface, with codes such as FLAASH. SSI also has developed software for simulating radiometrically accurate hyperspectral scenes to test sensor designs and retrieval algorithms.
- **Aerospace Phenomenology** -- SSI scientists are leading experts in modeling optical signatures from aircraft, rockets,

and non-equilibrium sources such as plumes, vapor clouds, chemical releases, and the high-altitude atmosphere. SSI's research includes first-principles quantum-mechanical and classical dynamics calculations of chemical reaction and energy transfer rates. In addition, SSI has played major roles in both planning and data analysis for optical measurement programs conducted by DoD and NASA.

- **Instruments for Gas Sensing** -- With the help of US Government SBIR program awards, SSI has developed new optical sensing technologies and gained experience in building custom ground- and aircraft-based instruments for sensing gaseous species including water vapor, hydrogen, hydrogen chloride, hydrogen fluoride, carbon monoxide, oxygen, nitrogen dioxide, ammonia, and hydrazine. SSI has licensed its patented technologies for gas sensing in commercial applications.
- **Reconstruction Techniques for Biomedical and Remote Sensing Applications** -- SSI has developed new software and experimental techniques for gamma ray and electron radiotherapy planning and breast cancer imaging, and has developed tomographic techniques for a variety of applications including combustion flows and remote targets.

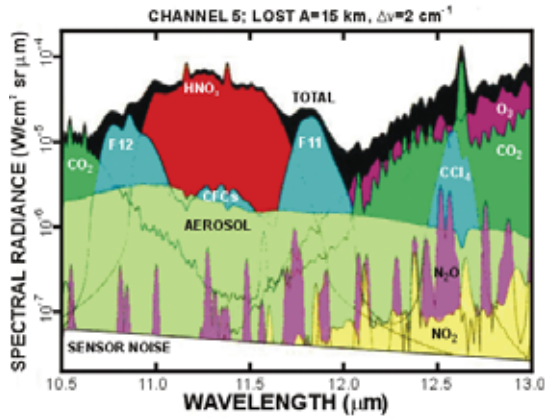
#### Software for Gas-Phase Spectroscopy and Remote Sensing

SSI has developed a number of first-principles computer models for radiation propagated through or generated by the atmosphere and by high-temperature and non-equilibrium gases. This software includes standard codes, such as MODTRAN, which are widely used by Government and industrial researchers and analysts. Applications include predicting atmospheric backgrounds, calculating atmospheric transmission for remote sensing, and simulating the optical properties of exhaust plumes and high-temperature process flows. Examples include:

- **MODTRAN (MODerate resolution TRANsmision model)** -- The DoD standard atmospheric infrared/visible/ultraviolet radiance and transmission band model for lower altitudes, is developed and maintained by SSI and the US Air Force Research Laboratory. MODTRAN rapidly predicts the atmospheric emission, thermal scatter, and solar scatter for arbitrary, refracted paths above the curved earth, incorporating the effects of molecular absorbers and scatterers, aerosols and clouds. MODTRAN's



*Spectral Sciences, Inc., facility at Burlington, MA.*



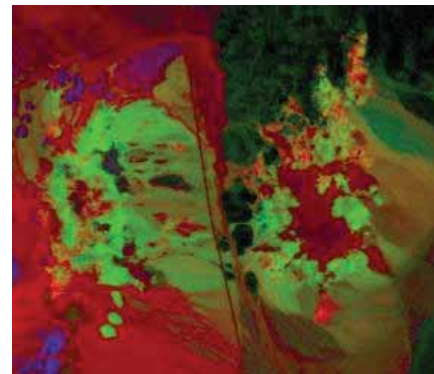
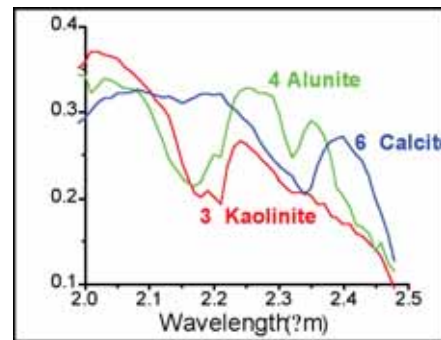
Simulation of spectral radiance viewed by the long-wavelength infrared MSX SPIRIT interferometer.

2-cm<sup>-1</sup> spectral resolution radiances and vertical fluxes have been extensively validated over its full spectral range from 1 to 50,000 cm<sup>-1</sup> (0.2 - 10,000 mm).

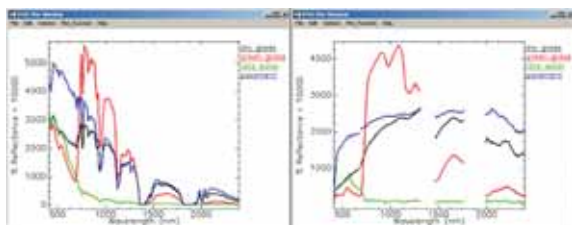
- **SHARC** -- SHARC (Strategic High-Altitude Radiation Code) was developed by SSI for the USAF as a non-equilibrium high-altitude (up to 300 km) infrared emission model for quiescent and aurorally disturbed atmospheres. The SHARC 3-D atmosphere model solves the chemical kinetic equations pertinent above 30 km altitude to determine non-equilibrium distributions of molecular vibrational states, which are incorporated into line-of-sight calculations to determine path radiances and transmittances from 30 to

300 km. SHARC has been validated against measurements, and includes the effects of atmospheric structure, auroral enhancements, and solar terminator physics.

- **SAMM and A3RTSS** -- The SAMM (SHARC And MODTRAN Merged) code provides a seamless integration of the SHARC and MODTRAN atmospheric radiation transport algorithms, extending the modeling capabilities down to ground level. The more recent SAMM2 code provides a uni-



SMACC-derived mineral endmembers (top) and their abundances (bottom) in AVIRIS imagery of Cuprite, NE.



Spectra of various materials from an AVIRIS hyperspectral image of Jasper Ridge, CA (top), before (left) and after (right) atmospheric correction using FLAASH.

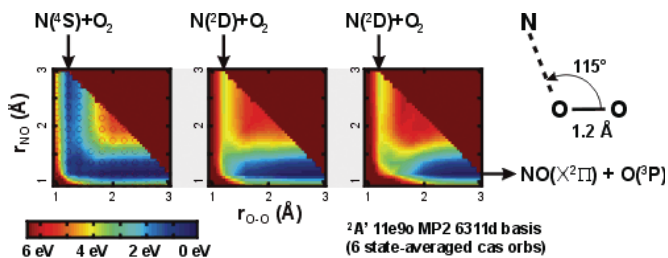
fied capability in which a single kinetic and radiation transport algorithm operates under both thermal equilibrium and non-equilibrium conditions. The new A3RTSS (All Altitude Atmospheric Radiation Transport for Scene Simulation) code is a completely restructured and modernized version of SAMM2 that incorporates new radiation transport algorithms of varying degrees of fidelity, increased efficiency for multiple line-of-sight scene computations, and the ability to readily integrate additional physical models.

A key application of atmospheric effects simulation is in remote hyperspectral and multispectral imaging (HSI and MSI) of the Earth's surface, where it is desirable to remove the effects of the atmosphere (e.g., from aerosol, water vapor, etc.) and reduce the data to units of spectral reflectance. In collaboration with the Air Force Research Laboratory and other US Government agencies, SSI has developed a state-of-the-art, first-principles atmospheric removal (or "correction") algorithm



called FLAASH (Fast Line-of-sight Atmospheric Analysis of Spectral Hypercubes). FLAASH handles data from a variety of HSI and MSI sensors, supports off-nadir as well as nadir viewing, and incorporates algorithms for water vapor and aerosol retrieval and adjacency effect correction. A version of FLAASH is available within ENVI (ENvironment for Visualizing Images), the powerful image visualization and processing software package from ITT Visual Information Systems ([www.ittvis.com](http://www.ittvis.com)) that is widely used by the remote sensing community.

SSI is also active in the development of algorithms for spectral image exploitation, including target detection and classification. For example, SSI scientists developed SMACC (Sequential Maximum Angle Convex Cone), a fast, fully automated endmember-finding and unmixing algorithm that can be applied to multispectral as well as hyperspectral



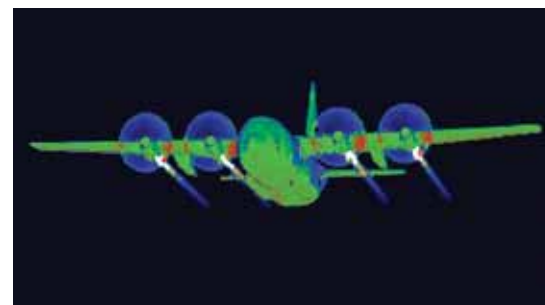
Computed Potential Energy Surfaces for the Reaction  $N(^2D) + O_2 \rightarrow NO + O$ .

data. It is licensed to ITT Visual Information Systems, and is included as a spectral analysis tool in ENVI.

### High-Altitude Phenomenology for Aerospace Applications

SSI scientists are experts in modeling complex physical and chemical processes important in aerospace applications, including phenomenology of quiescent and aurorally excited atmospheres, rocket plumes, vapor clouds, and chemical releases. These modeling efforts provide unique insight and understanding into the processes that govern observed radiation signatures. Much of SSI's phenomenology expertise has been gained through participation in planning and data analysis for DoD and NASA experimental programs in remote sensing, which include EXCEDE, HIRIS, SPIRITT, CIRRIS, MSX and NPOESS.

SSI's work in modeling rocket plumes and the atmospheric environment around spacecraft includes calculations of molecular flow and radiation fields using first-principles Monte Carlo techniques. **SOCRATES** (Spacecraft/Orbiter Contamination Representation Accounting for Transiently Emitted Species) is a Direct Simulation Monte Carlo code designed to predict the contamination and radiation environment around spacecraft. It is designed for use both as a research tool for specialists (it can simulate arbitrary species, arbitrary chemical reactions, trace species, etc.) and as a user-



High-fidelity visible and infrared scene and target simulations using MCSce (top) and QUID (bottom).

friendly tool for the non-specialist.

Great advances in computer speed and algorithms have made it possible to compute from first principles accurate rates and cross sections for chemical reactions that may be difficult or impossible to measure in the laboratory. Using the latest computational chemistry tools for electronic structure and molecular dynamics, SSI has applied a variety of techniques to compute fundamental reaction rates and cross sections for modeling atmospheric chemistry.

### Target and Scene Simulations

SSI has developed or supported a number of US Government and other computer codes for calculating and displaying target images and spectral signatures at wavelengths ranging from the visible through the thermal infrared. **QUID** (QUick Image Display) computes and displays high-fidelity radiance images at animation rates on graphics workstations and PCs. **GUIDES** is a Windows-based environment for running the SPIRITS aircraft signature code on a personal computer, providing quick setup, automatic error checking, and graphical and image display and analysis tools in an integrated package. **MCSce** is a Monte Carlo code for simulating radiometrically accurate spectral imagery including 3-D backgrounds, atmospheric descriptions, and embedded objects.

With support from the US Army, SSI is developing **kURT** ( $k$ -distribution based Ultra-fast Radiative Transfer), a package of transmittance and radiance routines designed for high-

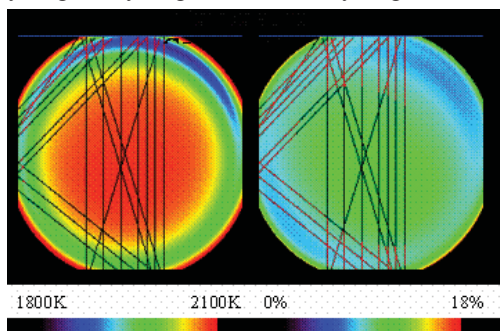


SSI gas measurement instruments: at top, open-path diode-laser sensor for HF installed in an aluminum pot room; at bottom, gas correlation sensor for carbon monoxide.

ly efficient scene simulation. KURT leverages a pre-calculated MODTRAN-based correlated-k database to achieve several orders of magnitude improvement in computation speed compared to MODTRAN for broad optical bandpasses and multiple lines of sight.

### Optical Technology Development

SSI has developed active and passive optical sensing technologies and custom ground- and aircraft-based instruments for measuring a variety of gaseous species, including water vapor, hydrogen, hydrogen chloride, hydrogen fluoride, car-



Tomographic reconstruction of temperature (left) and water concentration (right) from laboratory measurements in a liquid-fueled combustor.

bon monoxide, oxygen, nitrogen dioxide, ammonia, and hydrazine. SSI's optical gas correlation sensors for pollution monitoring have been incorporated in various field measure-

ment campaigns, including in-situ measurements of rocket plumes from SSI-built remotely piloted aircraft. SSI's patented molecular line-emitting lamp for gas correlation spectroscopy won an R&D 100 Award in 1989.

Recent work at SSI has focused on development of techniques for spatially resolved, optical flame temperature and concentration measurement for engine testing and control applications. Structured Emission Thermometry (SET) provides non-contact temperature and concentration mapping at a variety of locations within a turbine engine or other combustor. A near-infrared instrument has been used to measure water and soot temperatures in combustor test-stands. A mid-infrared version, under development, would provide simultaneous measures of temperature and CO, CO<sub>2</sub>, and H<sub>2</sub>O concentrations and pattern factors, and thus fully characterize the combustion flow field. An ultraviolet version would provide relative concentrations of multiple radical emitters such as OH\*, CH\*, and CO<sub>2</sub>\* for profiling of heat release and controlling combustor instabilities. When used in conjunction with tomographic reconstruction, SET can provide two-dimensional spatial profiles of these important combustion characteristics.

In SET, one or more passive fiber optic probes are used to view different parts of the hot flow field. The optical emission from each field-of-view is routed to a remote readout unit containing a compact multi-fiber spectrograph, which determines the temperature and concentration along each field-of-view based on the shape of the observed emission spectrum. For tomographic reconstruction, overlapping fields of view are used and the readout reconstructs the 2D spatial profile in the overlapping region.

### Summary

This paper has presented a brief summary of recent research and development programs and other activities at Spectral Sciences, Inc., emphasizing our experience in remote sensing and optical technology. Additional information about SSI, including selected technical publications and employment opportunities with our scientific/technical staff, may be found at our Web site, [www.spectral.com](http://www.spectral.com).

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## FEATURE

# Announcement of a new peer reviewed journal: 'IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing' (IEEE J-STARS)

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The 'IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing' (JSTARS) is a new quarterly publication jointly sponsored by the Geoscience and Remote Sensing Society (GRSS) and the IEEE Committee on Earth Observations (ICEO).

The Administrative Committee (AdCom) of the Geoscience and Remote Sensing Society has an ongoing strategic planning process. Recent deliberations have focused on developing new initiatives to expand the purview of the Society into a variety of application sectors of earth observations. This reflects the growing interest in application themes in the annual IGARSS conferences as well as the increasing involvement of GRSS in the ICEO. A new journal was envisaged as a communication and outreach medium for these applications themes.

The ICEO ([www.ieee-earth.org](http://www.ieee-earth.org)) is a committee of the Technical Activities Board of IEEE (TAB). The ICEO includes the interests of several IEEE committees and councils, and members have taken leadership roles in activities of the Global Earth Observations System of Systems (GEOSS: [www.earthobservations.org](http://www.earthobservations.org)). A new journal has been part of the development plan of ICEO from its inception.

A partnership between GRSS and ICEO on developing the new journal has been an obvious opportunity and, from the beginning, both groups have collaborated on the planning for

the new cosponsored journal. It will be a venue for peer reviewed papers on a variety of application themes in earth observations and remote sensing of relevance to the membership of both groups.

In addition, GRSS has seen the publication of the Transactions on Geoscience and Remote Sensing increase to 3736 pages and 343 articles in 2006. Many papers are part of special issues that result from GRSS sponsored or cosponsored symposia and workshops and similar initiatives. The increasing demand for special issues (seven printed and planned for 2007) will soon strain the editorial and review process. Some special issue topics, particularly those that fall in the applications area, will now be published by the new JSTARS to ease this load.

In developing the scope of the journal the initiatives of the ICEO have been reviewed and a survey of the GRSS membership and interested parties has been conducted. The following defines the range of issues appropriate for JSTARS:

"Papers should address current issues and techniques in applied remote and in situ sensing, their integration, and applied modeling and information creation for understanding the Earth. Applications are for the Earth, oceans and atmosphere. Topics can include observations, derived information such as forecast data, simulated information, data assimilation and Earth information techniques to address science and engineering issues of the Earth system. The technical content of papers must be both new and significant."

The first volume of JSTARS will appear in 2008. The first issue will be on "Earth Observations and Renewable Wind Energy". The Guest Editors are Ellsworth LeDrew, Lixin Wu, Mark Ahlstrom, and Thierry Ranchin.

The following issues are also planned for 2008:

1) "Special Issue on Remote Sensing of Human Settlements: Status and Challenges". The Guest Editors are

<sup>1</sup> ICEO is currently comprised of the Geoscience and Remote Sensing Society, Oceanic Engineering Society, Power Engineering Society, Computer Society, Aerospace and Electronic Society, Signal Processing Society, Communication Society, Systems Council, Sensors Council, Social Implications of Technology, IEEE Standards Associations, New Technology Directions



Paolo Gamba, Florence Tupin and Qihao Weng. 2) “ Special Issue on Wildland Fires and Biomass Burning”. The Guest Editors are Emilio Chuvieco, Chris Justice, and Ioannis Gitas.

As an awareness promotion, subscription to JSTARS for the first year (2008) as a digital product is free for every member of GRSS and every member of one of the IEEE Societies and Councils of ICEO.

Initially, paper submission will be handled through the TGRS Manuscript Central site (<http://mc.manuscriptcentral.com/tgrs>) while the dedicated JSTARS site is being built. The work flow for submission and review will be the same as that for TGRS and the site is expected to be on-line shortly.

We welcome individual articles and proposals for theme issues or special issues on topics relevant to JSTARS. Further information and guidance is available by contacting either the Editor-in-Chief or the Deputy Editor-in-Chief. We look for-

ward to collaborating with the membership on an important and exciting new chapter in the evolution of both the GRSS and ICEO.

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## REPORTS

### IEEE AWARDS, MAJOR GRS-S AWARDS AND FELLOW RECOGNITIONS AT THE IGARSS 2007 PLENARY SESSION

Werner Wiesbeck, IEEE GRS-S Awards Committee Chair

At the IGARSS 2007 Plenary Session on Monday, July 23rd in the Convention Center in Barcelona, Spain, two IEEE Awards, and three Major GRS-S Awards were presented, and four IEEE 2007 Fellows recognized.

This year the report for the IEEE GRS-S Paper Awards will be published as usual in the December issue of the GRS-S Newsletter, but because of the significance of the awards presented at the Plenary Session, we would like to announce them as soon as possible with this report in the September issue.

IGARSS 2007 was opened with the Plenary Session with distinguished guests, including the IEEE Division IX Director



*The Panel, listening to Corbella's Presentation, from left to right: Gregori Vazques, Chancellor Univer-sitat Politècnica de Catalunya; Ramon Moreno, Director General of Research; IEEE President-Elect Lewis Terman; Leung Tsang, IEEE GRS-S President; IEEE Division IX Director Richard Cox and Werner Wiesbeck, IEEE GRS-S Awards Chair.*



*IGARSS 2007 Chair presenting the impressive figures of the conference.*

Richard Cox and IEEE President-Elect Lewis Terman. Welcome addresses highlighted our GRS-Society, the IEEE, and Catalunya with its capital Barcelona. A few pictures with the speakers give an impression from the opening of IGARSS 2007. The IGARSS 2007 Conference Chair Ignasi Corbella presented the impressive figures of one of the most successful



IGARSS conferences ever: 1911 papers accepted, 946 oral presentations, 976 poster presentations, 1506 registered participants.



*The IEEE President-Elect Lewis Terman gave a view into the future of IEEE.*

The opening venue was chosen for the presentation of recognitions at the IEEE level as well as for the IEEE GRS-S Major Awards. After the welcoming addresses the IEEE Division IX Director Richard Cox presented the awards, supported by Werner Wiesbeck.

First, the 2007 Fellows were recognized.

#### **IEEE Fellow Awards**

The grade of IEEE Fellow recognizes unusual distinction in the profession and shall be conferred only by invitation of the IEEE Board of Directors upon a person of outstanding and extraordinary qualifications and experience in IEEE-designated fields. The IEEE Bylaws limit the number of members who can be advanced to Fellow grade in any one year to one per mil, that is 1 in 1000, of the Institute membership, exclusive of students and affiliates. To qualify, the candidate must be a Senior Member and be nominated by an individual familiar with the candidate's achievements. Endorsements are required from at least five IEEE Fellows, and an IEEE Society best qualified to judge. For IEEE members not registered in North America the requirements are somewhat less stringent. The IEEE Fellow Committee, comprising 25 IEEE Fellows, carefully evaluates all nominations and presents a list of recommended candidates to the IEEE Board of Directors for the final election.

The following GRS-S members were elevated to the Fellow status in 2006:

- **Prof. Melba M. Crawford** from the Purdue University, IN, USA
- **Prof. Kun-Shan Chen** from the National Central University Taiwan
- **Dr. Paris W. Vachon** from the Defence R&D Canada Ottawa, Canada
- **Grace Clark** from the Lawrence Livermore National Laboratory CA, USA

**Melba M. Crawford** received her Fellow Award with the citation: *"For Applications of Satellite Data and Airborne LIDAR Data."*

**Melba M. Crawford** received the B.S. and M.S. degrees in Civil Engineering from the University of Illinois, Urbana, in 1970 and 1973 respectively, and the Ph.D. degree in Systems Engineering from Ohio State University, Columbus, in 1981. She was a faculty member at the University of Texas at Austin from 1990-2005, and is currently at Purdue University, where she is Director of the Laboratory for Applications of Remote Sensing and Assistant Dean for Interdisciplinary Research in the Colleges of Agriculture and Engineering. She holds the Purdue Chair of Excellence in Earth Observation. Dr. Crawford has more than 100 publications in scientific journals, conference proceedings, and technical reports, and is internationally recognized as an expert in development of statistical methods for analysis of hyperspectral and lidar remote sensing data. In 2004-2005, Dr. Crawford was a Jefferson Senior Science Fellow at the U.S. Department of State. She is a Fellow of the IEEE Geoscience and Remote Sensing Society, where she is currently Vice President for Meetings and Symposia, and an Associate Editor of the IEEE Transactions on Geoscience and Remote Sensing. Dr. Crawford also served as a member of the NASA Earth System Science and Applications Advisory Committee (ESSAAC) and was a member of the NASA EO-1 Science Validation team for the Advanced Land Imager and Hyperion, which received a NASA Outstanding Service Award. She is currently a member of the advisory committee to the NASA Socio-economic Applications and Data Center at Columbia University.



*Melba M. Crawford (right) receiving the congratulation from with IEEE Division IX Director Richard Cox.*

The next on to be recognized is **Prof. Kun-Shan Chen** with the citation:

*"For Contributions to Remote Sensing Image and Signal Processing."*

**Kun-Shan Chen** (S'86, M'92, SM'98, F'07) obtained BSEE from National Taiwan Institute of Technology and



received the M. S. and Ph.D. degrees from the University of Texas at Arlington in 1987 and 1990, respectively, all in electrical engineering. Since 1992, he has been with the faculty of the Center for Space and Remote Sensing Research at the National Central University (NCU), where he served as Director from 2001-2004 and is now a NCU Distinguished Professor. He has joint appointments at the Institute of Space Sciences and Department of Computer Science and Information Engineering at the same university. His research activities involve the areas of microwave remote sensing, image processing and analysis for satellite and aircraft remote sensing data, radio and microwave propagation and scattering from terrain and ocean with applications to remote sensing and wireless communications. He has been the Editor-in-Chief of the Journal of Photogrammetry and Remote Sensing since 2001. He is the founding chair of the GRSS Taipei Chapter, an Associate Editor of the IEEE Transactions on Geoscience and Remote Sensing and a member of the Electromagnetic Academy.



*Kun-Shan Chen, (right) shaking hands with Division IX Director Richard Cox.*

The next on to be recognized is **Dr. Paris W. Vachon** with the citation:

*“For contributions to Operational Marine Applications of Imaging Radar.”*

**Paris W. Vachon** received the Bachelor of Applied Science (Honours) degree in Engineering Physics and the Ph.D. degree in Physical Oceanography from the University of British Columbia in 1983 and 1987, respectively.

From 1987-1988 he was a Visiting Fellow in a Canadian Government Laboratory at the Canada Centre for Remote Sensing (CCRS) and the RADARSAT Project Office in Ottawa, Canada. In 1988, he joined CCRS as a research scientist. From 1993-1994 he was a visiting scientist at the Nansen Environmental and Remote Sensing Center in Bergen, Norway. In 2003 he joined Defence Research and

Development Canada – Ottawa where he is leading the Radar Data Exploitation Group.

He was the Editor-in-Chief of the Canadian Journal of Remote Sensing from 1999 to 2003 and is an Associate Fellow of the Canadian Remote Sensing Society. His research interests include synthetic aperture radar processing and operational marine applications such as ship detection, ocean wind and wave retrieval, and intense storms such as polar lows and hurricanes.



*Paris W. Vachon (left) with Division IX Director Richard Cox.*

The next on to be recognized is **Grace Clark** with the citation: *“For Contributions in Block Adaptive Filtering.”*

**Grace A. Clark** earned the BSEE and MSEE degrees from the Purdue University Electrical Engineering Honors Program, West Lafayette, IN, and the Ph.D. ECE degree in electrical and computer engineering from the University of California Santa Barbara. Her research activities are in the theory and application of signal and image processing, estimation and detection, pattern recognition, and control. She served as a teaching assistant at Purdue and worked in the Mariner Telecommunications Group of the Caltech Jet Propulsion Laboratory. Since 1974, Grace has been with the University of California Lawrence Livermore National Laboratory (LLNL), where she is a research engineer in the National Security Engineering Division. She has served on the technical and thesis committees of three MS and two Ph.D. students at the University of California Davis. She has contributed more than 150 technical publications and serves as a reviewer for a variety of technical journals. She is a Member of the Acoustical Society of America, the Society of Exploration Geophysicists (SEG), Sigma Xi and Eta Kappa Nu. She is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE).



Grace A. Clark (right) with Division XI Director Richard Cox.



All 2007 IEEE GRS-S Fellows (from left) with our GRS-S President Leung Tsang, Melba Crawford, Kun-Shan Chen, Paris Vachon, Grace Clark, IEEE Division IX Director Richard Cox and Werner Wiesbeck.

The above recognition was followed by the first Award at the IEEE level, the 2007 IEEE Kiyo Tomiyasu Award

The IEEE Kiyo Tomiyasu Award is presented for outstanding early to mid-career contributions to technologies holding the promise of innovative applications.

The 2007 IEEE Kiyo Tomiyasu Award is presented to **Alberto Moreira** from the Deutsches Zentrum für Luft- und Raumfahrt DLR, Germany with the citation:

*“For development of synthetic aperture radar concepts.”*

**José Alberto Moreira** is a leader in the field of imaging radar technology and application. He is director of the Microwaves and Radar Institute at the German Aerospace Center in Oberpfaffenhofen, Germany, and professor of microwave remote sensing at the University of Karlsruhe, Germany. While he has developed new algorithms in high-resolution radar processing, image formation and interferometric techniques, his major accomplishment to date has been the development of innovative synthetic aperture radar (SAR) system concepts with polarimetric, interferometric and tomographic capabilities. SAR systems allow high-resolution, all-weather, day-and-night imaging of the earth’s surface. Since SAR is the only space-borne sensor with these capabilities, constellations of SAR satellites are today being deployed to provide global access and coverage for applications including

environmental remote sensing, road traffic monitoring, hazard and disaster monitoring as well as reconnaissance and those related to security.

Prof. Moreira holds 14 patents in the fields of SAR processing, advanced radar concepts and phased array antennas, and has participated in several space-borne SAR projects. He developed an innovative forward-looking radar system for enhanced vision, including a demonstration prototype of a new radar concept with digital beamforming. This concept is being adopted today for the development of future spaceborne SAR systems. The products of Prof. Moreira’s research have been used extensively by the German and European space programs, and he has managed many European Space Agency studies.

Prof. Moreira is an IEEE Fellow, a current member of the IEEE GRSS Adcom, and chair of the German Chapter of the GRS-S. He is a recipient of the IEEE Fred Nathanson Memorial Award for the “Young Engineer of the Year” and has previously received the NASA Certificate for outstanding contribution to the success the Shuttle imaging radar mission SIR-C/X-SAR.

Prof. Moreira holds bachelor’s and master’s degrees from the Technological Institute of Aeronautics, Sao Jose de Campos, Brazil, and master’s and doctoral degrees from the Technical University of Munich, Germany.



Alberto Moreira receives a certificate and a Medal as insignia of the IEEE Kiyo Tomiyasu Award from the IEEE Division IX Director Richard Cox. This award is, not only for Alberto Moreira but also for our Society, an outstanding success.

### IEEE GRS-S Major Awards

The call for nominations for the GRS-S Distinguished Achievement Award, GRS-S Outstanding Service Award and the GRS-S Education Award are published in the GRS-S Newsletter. Any member, with the exception of GRS-S AdCom members, can make nominations to recognize deserving individuals. Typically the lists of candidates comprise five to seven names. An independent Major Awards Committee makes the selection, which is approved by the GRS-S AdCom.

### IEEE GRS-S Distinguished Achievement Award

The Distinguished Achievement Award was established to recognize an individual who has made significant technical



contributions, within the scope of GRS-S, usually over a sustained period. In selecting the individual, the factors considered are quality, significance and impact of the contributions; quantity of the contributions; duration of significant activity; papers published in archival journals; papers presented at conferences and symposia; patents granted; and advancement of the profession. IEEE membership is preferable but not required. The award is considered annually and presented only if a suitable candidate is identified. The awardee receives a plaque and a certificate.

The 2007 IEEE GRS-S Distinguished Achievement Award is presented to **Prof. Giorgio Franceschetti** from the Università di Napoli Federico II, Italy with the citation:

*“For outstanding research in Electromagnetics, Propagation, Remote Sensing and Information Data Processing.”*

**Giorgio Franceschetti** (S’60–M’62–SM’73–F’88–LF’01) was born in Italy. Since 1968, he has been a Full Professor of electromagnetic wave theory at the Università di Napoli “Federico II,” Naples, Italy. He was a Visiting Professor at the University of Illinois, Urbana-Champaign, in 1976 and 1977, and at the University of California at Los Angeles (UCLA) from 1980 to 1982. He was a Research Associate at the California Institute of Technology (Caltech), Pasadena, in 1981 and 1983, a Visiting Professor at the National Somali University, Somalia, in 1984, and a Visiting Professor at the University of Santiago de Compostela, Spain, in 1995. He was the Director of the Istituto di Ricerca per l’Elettromagnetismo e i Componenti Elettronici, Naples, a Research Institute of the Italian National Research Council. He has lectured in several summer schools in China, Great Britain, Holland, Italy, Spain, Sweden, and the U.S. He was a Fulbright Scholar at Caltech, in 1973. He is currently an Adjunct Professor at UCLA and a Distinguished Visiting Scientist at the Jet Propulsion Laboratory, Pasadena. He has



*The proud IEEE GRS-S Distinguished Achievements Award recipient Giorgio Franceschetti (left) receives from the GRS-S President Leung Tsang a plaque and a certificate.*

published several books and more than 140 refereed papers in the field of applied electromagnetics (reflector antennas, transient phenomena, shielding, nonlinear propagation, and scattering) and, more recently, in the field of SAR data processing and simulation. Prof. Franceschetti is a former member of the Board of the Italian Space Agency. He was the recipient of several national and international awards.

#### **IEEE GRS-S Outstanding Service Award**

The Outstanding Service Award was established to recognize an individual who has given outstanding service for the benefit and advancement of the Geoscience and Remote Sensing Society. The award shall be considered annually but will not be presented unless a suitable candidate is identified. The following factors are suggested for consideration: leadership innovation, activity, service, duration, breadth of participation and cooperation. GRS-S membership is required. The awardee receives a certificate.

The 2007 Outstanding Service Award is presented to **Prof. Jón Benediktsson** from the University of Iceland Reykjavik Island with the citation:

*“In recognition of his outstanding service for the benefit and advancement of the IEEE Geoscience and Remote Sensing Society.”*

**Jón Atli Benediktsson** (S’86–M’90–SM’99–F’04) received the Cand.Sci. degree in electrical engineering from the University of Iceland, Reykjavik, and the M.S.E.E. and Ph.D. degrees from Purdue University, West Lafayette, IN, in 1984, 1987, and 1990, respectively. He is currently a Professor of electrical and computer engineering at the University of Iceland. He has held visiting positions at the Department of Information Technology and Communication Sciences at the University of Trento (2002–), Department of Electrical Engineering, the University of Washington (2006), School of Computing and Information Systems, Kingston University, Kingston upon Thames, U.K. (1999–2004), the Joint Research Centre of the European Commission, Ispra, Italy (1998), Denmark’s Technical University (DTU), Lyngby (1998), and the School of Electrical and Computer Engineering, Purdue University (1995). He was a Fellow at the Australian Defence Force Academy (ADFA), Canberra, in August of 1997. From 1999 to 2004, he was Chairman of the energy company Metan Ltd. His research interests are in remote sensing, pattern recognition, neural networks, image processing, and signal processing, and he has published extensively in those fields. Dr. Benediktsson received the Stevan J. Kristof Award from Purdue University in 1991 as outstanding graduate student in remote sensing. In 1997, he was the recipient of the Icelandic Research Council’s Outstanding Young Researcher Award, and in 2000, he was granted the IEEE Third Millennium Medal. He is Editor of



IEEE Transactions on Geoscience and Remote Sensing (TGARS) and was an Associate Editor TGARS from 1999 to 2002. He co-edited (with Professor David A. Landgrebe) a Special Issue on Data Fusion of TGARS (May 1999). In 2002, he was appointed Vice President of Technical Activities in the Administrative Committee of the IEEE Geoscience and Remote Sensing Society (GRSS). From 1996 to 1999, he was the Chairman of GRSS' Technical Committee on Data Fusion and was elected to the Administrative Committee of the IEEE Geoscience and Remote Sensing Society (GRSS) for the term 2000 to 2002, and in 2002, he was appointed Vice President of Technical Activities of GRSS. He was the founding Chairman of the IEEE Iceland Section and served as its Chairman from 2000 to 2003. He is the Chairman of the University of Iceland's Science and Research Committee (from 1999), a member of Iceland's Science and Technology Council, and a member of the Nordic Research Policy Council. He was a member of a NATO Advisory Panel of the Physical and Engineering Science and Technology Sub-Program (2002–2003). He is a member of Societas Scientiarum Islandica and Tau Beta Pi.



Jón Atli Benediktsson (right) is the recipient of the 2007 IEEE GRS-S Outstanding Service Award.

### IEEE GRS-S Education Award

The Education Award was established to recognize an individual who has made significant educational contributions to the field of GRS-S. In selecting the individual, the factors considered are significance of the educational contribution in terms of innovation and the extent of its overall impact. The contribution can be at any level, including K-12, undergraduate and graduate teaching, professional development, and public outreach. It can also be in any form (e.g. textbooks, curriculum development, educational program initiatives). IEEE GRSS membership or affiliation is required. The awardee receives a certificate.

The 2007 Education Award is presented to **Prof. Eric Pottier** from the Universite de Rennes 1 Rennes Cedex France with

the citation:

*"In recognition of his significant educational contributions to Geoscience and Remote Sensing."*

**Eric Pottier** (M'95, SM'06) received the MSc and Ph.D. in signal processing and telecommunication from the University of Rennes 1, respectively in 1987 and 1990, and the Habilitation from the University of Nantes in 1998.

From 1988 to 1999 he was an Associate Professor at IRESTE -University of Nantes, Nantes, France where he was the Head of the Polarimetry Group of the Electronic and Informatic Systems Laboratory. Since 1999, he has been a Full Professor at the University of Rennes 1, France, where he is currently the Deputy Director of the Institute of Electronics and Telecommunications of Rennes (I.E.T.R – CNRS UMR 6164) and also Head of the Image and Remote Sensing Group – SAPHIR Team. His current activities of research and education are centered in the topics of analog electronics, microwave theory and radar imaging with emphasis in radar polarimetry. His research covers a wide spectrum of areas from radar image processing (SAR, ISAR), polarimetric scattering modeling, supervised/unsupervised polarimetric segmentation and classification to fundamentals and basic theory of polarimetry.

Since 1989, he has supervised more than 50 research students to graduation (MSc and PhD) in Radar Polarimetry covering areas from theory to remote sensing applications. He has chaired and organized 31 sessions in International Conferences and was member of the Technical and Scientific Committees of 19 International Symposium or Conferences. He has been invited to present 33 presentations in International Conferences and 16 in National Conferences. He has 7 publications in books, 38 papers in refereed journals and more than 250 papers in Conference and Symposium proceedings. He has presented advances courses and seminars on Radar Polarimetry to a wide range of organizations

He received the Best Paper Award during EUSAR2000 for his research activities, co-authored with J.S. Lee (U.S. Naval Research Laboratory), in the topic of polarimetric unsupervised segmentation of POL-SAR data.



Eric Pottier (left) receives the third major IEEE GRS-S award, the Education Award from our President.



*The group of all three major IEEE GRS-S Award recipients poses with our President and the Awards Chair.*

A second Award on IEEE level one by one of our GRS-S members is the 2007 IEEE Dennis J. Picard Medal for Radar Technologies and Applications

The IEEE Dennis J. Picard Medal for Radar Technologies and Applications was established in 1999 for outstanding accomplishments in advancing the fields of Radar technologies.

The 2007 IEEE Dennis J. Picard Medal for Radar Technologies and Applications is presented to **Dr. R. Keith Raney** from the Johns Hopkins University Applied Physics Laboratory USA with the citation:

*“For exemplary conceptual innovation and technical leadership in the implementation and application of earth-observing and planetary radars.”*

**Dr. Raney** (LF) received a BS (with honors) in physics from Harvard University (1960), a MSEE from Purdue University (1962), and a PhD in Computer Information and Control from the University of Michigan (1968). He contributed to the design of NASA’s Venus radars Pioneer and Magellan, the ERS-1 SAR of the European Space Agency (ESA), and the Shuttle Imaging Radar SIR-C. While with the Canada Centre for Remote Sensing (1976-1994) Dr. Raney was the scientific authority for the world’s first digital processor for satellite SAR data, and responsible for the conceptual design of the RADARSAT synthetic aperture radar (SAR). These and other contributions in radar remote sensing systems, theory, and applications are documented in more than 300 professional publications.

Dr. Raney was on NASA’s Instrument Definition Teams for the Europa Orbiter and several Mars missions, the IDTs and Science Teams for Magellan and Pioneer Venus, and advisory teams for ESA’s ERS radars. He is on the Science Advisory Group for ESA’s CryoSat radar altimeter, whose design is based on his original concept. He holds several United States and international patents on various aspects of radar. He served for more than 20 years as an Associate Editor (radar) for the IEEE Transactions on Geoscience and Remote Sensing. He has served on numerous advisory committees for the Office of Naval Research, the U.S. National Academy of

Sciences, Germany’s Helmholtz Society, and the Danish Technical Research Council, among others. He is a Fellow of the Electromagnetics Academy, and an Associate Fellow of the Canadian Aeronautics and Space Institute. Dr. Raney is a recipient of numerous awards, including the 1999 Gold Medal of the Canadian Remote Sensing Society, the IEEE Geoscience and Remote Sensing Society Transactions Prize Paper for 1998, and the IEEE Millennium Medal 2000. The



*Keith Raney (left) receives the 2007 IEEE Dennis J. Picard Medal for Radar Technologies and Applications from the IEEE Division IX Director Richard Cox, a really outstanding honor.*



*The awards presentation was closed with a gathering of the two IEEE award recipients Alberto Moreira and Keith Raney with the opening panel members and Kiyoo Tomiyasu (4th from the right), the sponsor of IEEE Kiyoo Tomiyasu Award.*

Opening Ceremony was followed by the Plenary Session with presentations by leading scientists in the fields of climate research and international remote sensing co-operations. The plenary speakers out-lined the state of the art in climate research and the future requirements for international co-operations to handle these tasks that are global and not limited by borders.



The panel members listen to their first speaker, Johannes Schmetz from EUMETSAT; from left Ignasi Corbella, Jay Pearlman, Chair of ICEO; Doug Muchoney, GEOS; Graeme Stephens, Colorado State University and Stefano Bruzzi, Directorate of ESA Earth Observations.

A short summary of the panel presentations is that there is definitely a climate change but we are presently not able to globally monitor the climate accordingly nor to precisely identify the reasons individually. It seems the global climate interactions are so interwoven that it will take many more years to model the whole process correctly in order to understand it. The frontiers and the chances for remote sensing became obvious.

The panel presentations initiated intensive discussion among the conference participants.

See you next year, July 7th to 11th in Boston, United States,

**Werner Wiesbeck**

## CALL FOR NOMINATIONS

### **GRS-S Distinguished Achievement Award (DAA)**

*Eligibility: IEEE membership is not required but is recommended.*

The Distinguished Achievement Award was established to recognize an individual who has made significant technical contributions, usually over a sustained period, within the scope of the Geoscience and Remote Sensing Society. In selecting the individual, the factors considered are quality, significance and impact of the contributions; quantity of the contributions; duration of significant activity; papers published in archival journals; papers presented at conferences and symposia; patents granted; advancement of the profession. The award is considered annually and presented only if a suitable candidate is identified. The awardee receives a plaque and a certificate.

### **GRS-S Education Award (EA)**

*Eligibility: Member or Affiliate Member of the IEEE GRS-S*  
The purpose of this award is to reward significant educational contributions in the field of remote sensing. The award shall be considered annually, but will only be awarded when an outstanding recipient is identified.

### **GRS-S Outstanding Service Award (OSA)**

*Eligibility: Must be an IEEE GRS-S member.*  
The Outstanding Service Award was established to recog-

nize an individual who has given outstanding service for the benefit and advancement of the Geoscience and Remote Sensing Society. The award shall be considered annually but not be presented if a suitable candidate is not identified. The following factors are suggested for consideration: leadership, innovation, activity, service, duration, breadth of participation and cooperation. The awardee receives a certificate.

### **Nomination Items:**

- Nomination letter
- Candidate biography
- CV with pertinent achievements
- List of publications (only DAA)

### **Deadline: Dec. 1st each year**

Please send the nomination directly to (electronic submission is appreciated):

Prof. Werner Wiesbeck  
Chair, GRS-S Awards Committee  
University of Karlsruhe  
Kaiserstrasse 12  
76131 Karlsruhe, GERMANY  
E Mail: werner.wiesbeck@ihe.uka.de



## CALL FOR PAPERS

# TGARS Special Issue on Retrieval of Bio- and Geophysical Parameters from SAR Data for Land Applications

A Special Issue of the IEEE Transactions on Geoscience and Remote Sensing (TGARS) devoted to the Retrieval of Bio- and Geophysical Parameters from SAR Data for Land Applications has recently been approved by the TGARS Editorial Board.

This Special Issue is associated with the 5th International Symposium on Retrieval of Bio- and Geophysical Parameters from SAR Data for Land Applications, to be held in Bari, Italy, from September 25 to September 28, 2007. Held approximately every three years since their inception in 1995, these meetings provide a good opportunity for specialists in this field to exchange experience gained in relating land bio-/geophysical variables to SAR remote sensing data acquired from ground based, airborne and spaceborne platforms.

The purpose of this Special Issue – open to all researchers – is to report on recent advances in this field. During the last three years, the use of multi-mode spaceborne SAR data has benefited from systems such as ENVISAT-ASAR and, more recently, ALOS-PALSAR. These data have stimulated new research in the retrieval of bio-/geophysical parameters over land surfaces also driven by the information needs of initiatives such as the EU GMES program. Further momentum to the research in the field originated from the preparation of the forthcoming TerraSAR-X, Radarsat-2 and Cosmo-SkyMed missions. In addition, numerous flights of airborne SAR sensors, preparing future missions (e.g. Sentinel-1), fed the debate about optimal configurations of future SAR sensors. In the meantime, the scientific community has also been active in the consolidation of novel techniques (e.g. Pol-InSAR) and in the investigation of alternative SAR configurations (e.g. lower and higher frequencies) for specific land applications.

Papers are solicited on the retrieval of bio- and geophysical information over the whole range of land applications, including forestry, hydrology, wetlands, ice and snow, glaciology, land cover changes, agriculture, soils, urban mapping, geology, geomorphology, surface deformation, hazards, floods, land-

slides, electromagnetic modelling and simulations as well as new spaceborne SAR missions. Papers on the use of SAR data in process modelling will also be welcomed. It is expected that contributions will cover the whole range of spaceborne and airborne systems and techniques, including multi-frequency, polarimetry and interferometry.

Prospective authors should follow the regular guidelines of the IEEE Transactions on Geoscience and Remote Sensing, as listed in the back cover of the Transactions. Authors should submit their manuscripts electronically to <http://mc.manuscriptcentral.com/tgrs>. Instructions for creating new accounts, if necessary, are available on the login screen. Please indicate in your submission that the paper is intended for Special Issue by selecting “BioGeoSAR Special Issue” from the pull-down menu for manuscript type. Questions concerning the submission process should be addressed to [tgars-editor@ieee.org](mailto:tgars-editor@ieee.org). Inquiries concerning the Special Issue should be directed to the Guest Editors:

**Dr. Francesco Mattia**, Email: [F.Mattia@ba.issia.cnr.it](mailto:F.Mattia@ba.issia.cnr.it)  
Consiglio Nazionale delle Ricerche (CNR)  
Istituto di Studi sui Sistemi Intelligenti per l'Automazione (ISSIA)

**Dr. Nicolas Floury**, Email: [Nicolas.Floury@esa.int](mailto:Nicolas.Floury@esa.int)  
European Space Agency (ESA) / European Space Research and Technology Centre (ESTEC)

**Dr. Alberto Moreira**, Email: [Alberto.Moreira@dlr.de](mailto:Alberto.Moreira@dlr.de)  
German Aerospace Center (DLR) / Microwaves and Radar Institute (HR)

Updated information on the Special Issue of TGARS is available at <http://www.congrex.nl/07c07>.

Submission deadline: 28 January 2008



## CALL FOR PAPERS

# “Traitement du Signal” Special Issue on Remote Sensing for the Monitoring and the Mangement of the Environment.

Numerous sensors and operational space missions now allow an easy observation of the Earth. The temporal revisit time has been drastically reduced and the resolution (both spatial and spectral) of the available data has been significantly increased over the past few years. These technical improvements enable an accurate monitoring of the environment and the management of the corresponding issues.

Supported by the newly founded IEEE Geoscience and Remote Sensing Society French Chapter, the journal "Traitement du Signal" is editing a special issue devoted to Remote Sensing for the Monitoring and the Mangement of the Environment. The aim of this special issue is to bridge thematic issues with methodological tools in relation with environmental issues.

Papers are specifically solicited on the following topics pertaining to remote sensing of the environment:

1. Thematic issues: urban remote sensing, precision agriculture, ressources management, pollution monitoring, climate related issues...
2. Methodologies: registration, advanced radar processing (bistatic, polarimetry, interferometry...), change detection, classification (supervised/unsupervised), fusion...
3. Systems: Missions, drones, new challenges

Prospective authors should follow the regular guidelines of "Traitement du Signal", as listed on the web page <http://revuets.lis.inpg.fr/>, and submit their manuscripts elec-

tronically. Naturally, english submissions are also accepted.

Questions concerning the submission process and any inquiry concerning the special issue should be directed to the Guest Editors:

**Jocelyn Chanussot**, E-mail: [jocelyn.chanussot@lis.inpg.fr](mailto:jocelyn.chanussot@lis.inpg.fr)  
Grenoble Institute of Technology (INP Grenoble) - GIPSA-Lab, Grenoble, France

**Didier Massonnet**, E-mail: [didier.massonnet@cnes.fr](mailto:didier.massonnet@cnes.fr)  
Centre National d'Etudes Spatiales, CNES, Toulouse, France.

**Grégoire Mercier**, E-mail: [gregoire.mercier@enst-bretagne.fr](mailto:gregoire.mercier@enst-bretagne.fr)  
Ecole Nationale Supérieure des Télécommunications de Bretagne, Brest, France.

**Alexandre Jouan**, E-mail: [Alexandre.Jouan@drdc-rddc.gc.ca](mailto:Alexandre.Jouan@drdc-rddc.gc.ca)  
Optronique Surveillance, Québec, Canada

Submission deadline: November 30 2007  
Publication: November 2008

This special issue is supported by CNES, the IEEE Geoscience and Remote Sensing French and Quebec Chapters and by the Grenoble Institute of Technology.



Meeting Chairs:  
 Simonetta Paloscia  
 Giovanni Macelloni  
 IFAC-CNR, Florence, Italy  
 Abstract submission:  
 October 22, 2007  
 Email:  
 info@microrad2008.org  
 Web Address:  
 www.microrad2008.org

10<sup>th</sup> Specialist Meeting on  
**MICROWAVE RADIOMETRY**  
 and  
**REMOTE SENSING**  
 for the  
**ENVIRONMENT**



11-14 March 2008  
 Hotel Baglioni - Florence, Italy



organised by  
 Centro di Telerilevamento a Microonde  
 and  
 Istituto di Fisica Applicata (IFAC-CNR)

**ESA-EUSC 2008:**  
**Image Information Mining -**  
**pursuing automation of geospatial**  
**intelligence for environment and security**

Honorary Conference for Dr. Klaus Seidel  
 March 4-6, 2008  
 ESRI - Frascati (Italy)

European Space Agency  
 European Union Satellite Centre



**ESA-EUSC 2008 Chair:**  
 M. Datcu, DLR -German Aerospace Center

**Abstract submission:**  
 Before October 15, 2007  
 Extensive abstract  
 Email: [mihai.datcu@dlr.de](mailto:mihai.datcu@dlr.de) copy [Sergio.DElia@esa.int](mailto:Sergio.DElia@esa.int)

**Register:**  
 Before February 1, 2008

**Registration fees:**  
 Free of charge (up to available seats)

**Web Address:**  
[http://earth.esa.int/rtd/Events/ESA-EUSC\\_2008/index.html](http://earth.esa.int/rtd/Events/ESA-EUSC_2008/index.html)

**INTERNATIONAL CONFERENCE**  
**ON**  
**RADIO SCIENCE**  
**ICRS-2008**  
**25<sup>th</sup> - 29<sup>th</sup> February 2008**  
**JODHPUR, INDIA**



DEPARTMENTS OF GOVERNMENT OF INDIA AND RAJASTHAN

**TOPICS TO BE COVERED IN CONFERENCE:**

- ❖ Electromagnetic Metrology
- ❖ Fields and Waves
- ❖ Radiocommunication Systems and Signal Processing
- ❖ Electronics and Photonics
- ❖ Electromagnetic Noise and Interference
- ❖ Wave Propagation and Remote Sensing
- ❖ Ionospheric Radio and Propagation
- ❖ Waves in Plasmas
- ❖ Radio Astronomy
- ❖ Electromagnetics in Biology & Medicine

**IMPORTANT DATES:**

Submission of Summary (500 words): 15 September 2007  
 Notification of acceptance: 15 October 2007  
 Submission of full paper for publication in conference proceedings: 15 December 2007  
 Email: [info@radioscience.org](mailto:info@radioscience.org), [opncalla@yahoo.co.in](mailto:opncalla@yahoo.co.in)  
 Website: [www.radioscience.org](http://www.radioscience.org), [www.icrsju.org](http://www.icrsju.org)  
 Contact: Prof. O.P.N. Calla, Chairman, ICRS-2008

**ORGANISED BY:**  
**INTERNATIONAL CENTRE FOR RADIO SCIENCE (ICRS)**  
**"OM NIWAS"**  
 A-23, Shastri Nagar  
 Jodhpur-342003  
 Phone: 91-291-2613123, 2640063, Fax: 91-291-2626166



**Geospatial Dimensions of**  
**Emergency Response Symposium**

March 10-12, 2008 • Washington State Trade & Convention Center • Seattle, Washington

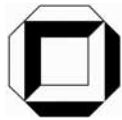
Don't miss the first-ever symposium to address the application of mapping technologies such as geographic information systems (GIS), GPS, and remote sensing to emergency and disaster response.

The conference will kick off with a four-hour seminar followed by a series of technical sessions. The symposium is being held in parallel with GITA's Geospatial Infrastructure Solutions Conference 31. There will be a shared exhibit floor and registration, and social events will be open to attendees of both conferences.

**Visit [gita.org/ers](http://gita.org/ers) for more information!**

Supporting Organizations:





**Universität Karlsruhe (TH)**  
Research University • founded 1825

At the Institute for Photogrammetry and Remote Sensing, University of Karlsruhe, a tenured position

**Full Professor of Remote Sensing and Image Processing (W3)**

is vacant and sought to be filled by 1. April 2008.

Any successful competitor will represent the area of Image Processing and Remote Sensing in both teaching and research. He/she is expected to have distinguished himself/herself as a scholar for methods and experimental research in Digital Image Processing, with applications in photogrammetry and remote sensing. It is expected that the candidate will further develop the methods of digital image processing and remote sensing for quantitative measurements, navigation, as well as object documentation. Experience with the definition and completion of research projects, as well as the attraction of extramural funds, will be necessary.

Teaching in the areas of Remote Sensing and Digital Image Processing is required to serve students in the Geodesy and Geoinformatics program (from winter semester 2008/09: B.E. and M.E. degrees). In addition, teaching will be requested from other programs such as Geo-Ecology, Meteorology, Economics, as well as Regional Science and Resources Engineering devoted to foreign students.

The successful candidate will become director of the Institute for Photogrammetry and Remote Sensing. He/she is expected to cooperate in the restructuring of both the institute and the study program in Geodesy and Geoinformatics, and to continue the close relationships with other Earth oriented Institutes at the KIT and abroad.

Applications with standard documentations, a list of teaching and research experience as well as five selected reprints of own publications should be sent by September 15, 2007 to the

Dean of Civil Engineering, Geo- and Environmental Sciences, University of Karlsruhe (TH), 76128 Karlsruhe, Germany, or by e-mail to: [dekanat@bgu.uca.de](mailto:dekanat@bgu.uca.de)

**IGARSS**  
International Geoscience and Remote Sensing Symposium

Graphic of ITOS Satellite in Orbit/NOAA In Space Collection

## Future Locations

**IGARSS 2008 • Boston Massachusetts**  
7-11 July • Hynes Veteran Memorial Convention Center  
John Kerekes, Rochester Institute of Technology ([kerekes@cis.rit.edu](mailto:kerekes@cis.rit.edu)), and Eric Miller, Tufts University ([emiller@ecc.tufts.edu](mailto:emiller@ecc.tufts.edu)), General Co-Chairmen

**IGARSS 2009 • Capetown South Africa**  
Harold Ansegarr, Rand Afrikaans University ([ansegarrh@geosciences.wits.ac.za](mailto:ansegarrh@geosciences.wits.ac.za)) General Chairman

**IGARSS 2010 • Honolulu, Hawaii**  
Karen St. Germain, NPOESS IPO ([karen.stgermain@noaa.gov](mailto:karen.stgermain@noaa.gov)) and Paul Smits, ISPR ([paul.smits@jrc.it](mailto:paul.smits@jrc.it)), General Co-Chairs

If you are interested in forming a team to host IGARSS' 12 from North America or Europe please contact: IEEE GRS-S at: [ieeegrss@adelphia.net](mailto:ieeegrss@adelphia.net) for more information



## UPCOMING CONFERENCES

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

- Name: **International Symposium on Generalization of Information** Dates: December 28 – 30, 2007  
Location: Geneva (Carouge) Switzerland Email: [info@icer07.org](mailto:info@icer07.org)  
Dates: October 1 – 3, 2007 URL: <http://www.icer07.org/>  
Contact: Horst Kremers, Program Committee Chair  
Email: [office@horst-kremers.de](mailto:office@horst-kremers.de)  
URL: <http://www.codata-germany.org/ISGI/>
- Name: **International Microwave and Optoelectronics Conference** Name: **International Conference on Radio Science**  
Location: Salvador, Brazil Location: Jodhpur, India  
Dates: October 29 – November 1, 2007 Dates: February 25 – 29, 2008  
Contact: Evandro Conforti Contact: Prof. O.P.N. Calla, Chairman, ICRS 2008  
Email: [conforti@dmo.fee.unicamp.br](mailto:conforti@dmo.fee.unicamp.br) Email: [infop@radioscience.org](mailto:infop@radioscience.org) or [opncalla@yahoo.co.in](mailto:opncalla@yahoo.co.in)  
URL: <http://www.imoc2007.fee.unicamp.br> URL: <http://www.radioscience.org> or  
<http://www.icrsju.org>
- Name: **User Centered Knowledge Environments: from Theory to Practice (I2LOR-07)** Name: **ESA-EUSC 2008: Image Information Mining – pursuing automation of geospatial intelligence for environment and security**  
Location: TELUQ-UQAM University, Montreal, QC Location: ESRIN – Frascati, Italy  
Dates: November 4 – 7, 2007 Dates: March 4 – 6, 2008  
Email: [I2LOR-07@LORNET.ORG](mailto:I2LOR-07@LORNET.ORG) Contact: M. Datcu, DLR – German Aerospace Center  
URL: <http://www.lornet.org/> Email: [mihai.datcu@dlr.de](mailto:mihai.datcu@dlr.de) copy [Sergio.Delia@esa.int](mailto:Sergio.Delia@esa.int)  
URL: <http://earth.esa.int/rtd/Events/ESA-EUSC2008/index.html>
- Name: **IEEE Global Communications Conference (Globecom 2007)** Name: **Geospatial Dimensions of Emergency Response Symposium**  
Location: Washington, DC Location: Washington State Trade & Convention Center, Seattle, Washington  
Dates: November 23 – 30, 2007 Dates: March 10 – 12, 2008  
Contact: Jerry Gibbon Contact: (303)337-0513  
Email: [j.t.gibbon@ieee.org](mailto:j.t.gibbon@ieee.org) or [krauscher@alcatel-lucent.com](mailto:krauscher@alcatel-lucent.com) Email: [info@gita.org](mailto:info@gita.org)  
URL: <http://www.ieee-globecom.org/2007/> URL: <http://www.gita.org/ers>
- Name: **Int. Joint Conferences on Computer Information, Systems Science, and Engineering** Name: **10th Specialist Meeting on Microwave Radiometry and Remote Sensing for the Environment**  
Location: (e-conference) Location: Hotel Baglioni, Florence, Italy  
Dates: December 3 – 12, 2007 Dates: March 11 – 14, 2008  
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URL: <http://www.cisse2007online.org/> URL: <http://www.microrad2008.org>
- Name: **International Conference on Environmental Research** Name: **International Microwave Conference (IMS)**  
Location: Bhopal, India Location: Atlanta, GA  
Dates: June 15 – 20, 2008  
URL: <http://www.ims2008.org>

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