

Foreword to the Special Issue on the 8th Specialist Meeting on Microwave Radiometry and Remote Sensing Applications (MicroRad04)

THE 8th Specialist Meeting on Microwave Radiometry and Remote Sensing Applications (MicroRad04) was held on February 24-27, 2004 in Rome, Italy. The coorganizers of the Conference were Prof. N. Pierdicca of The University of Rome "La Sapienza" and Prof. F. S. Marzano of CETEMPS, University of L'Aquila. The meeting was an overwhelming success and can be summarized by 162 submitted abstracts, 152 participants, 85 oral presentations, and 42 interactive posters during four full days of sessions.

MicroRad04 was held at the Engineering College of the University of Rome "La Sapienza" situated in one of the most beautiful sites of the Eternal City, between the Colosseum, the archaeological area, and the early Christian Basilicas. It was the latest of a series focusing on Microwave Radiometry and Remote Sensing of the Environment. The very first one dates back to March 1983, when it was organized and supported by the University "La Sapienza" of Rome, Italy, as a result of the initiative of Prof. G. d'Auria. The satisfactory outcome of the first meeting stimulated an agreement among the participants to ensure the continuity in the form of a periodic meeting, the second of which, supported by IROE-CNR in Florence, Italy, occurred in 1988. Since then, more regular meetings, every 30 months approximately, were scheduled and held in the U.S. (Boulder, CO, 1992; Boston, MA, 1996) and in Italy (Rome "Tor Vergata," 1994; Florence, 1999), alternately. In 2001, the meeting was hosted by NOAA in Boulder, CO.

The MicroRad04 Meeting was organized by the Department of Electronic Engineering of the University "La Sapienza" of Rome and was created as an open invitation to convene again in Rome, 20 years after the first meeting. The objective of MicroRad04 was to set up a common forum to report and discuss recent advances in the specific field of microwave radiometry, thus to gather all parties belonging to the research and industrial community, active in projects and studies in microwave radiometry of atmosphere, ocean, and land.

Contributions on topics of primary interest were received, and the papers were separated into both oral and interactive sessions. The 15 sessions of the meeting were focused on classical and new advanced topics of environmental remote sensing by microwave radiometry, emphasizing the methodological, instrumental, and application point of views. Interdisciplinary and sensor synergy issues were also stimulated.

The meeting was opened by the greetings of the Faculty Dean Dr. T. Bucciarelli and of the Director of Electronic Engineering Department Dr. G. d'Inzeo as well as by an introduction from the Scientific Chairman Dr. G. d'Auria. The first two sessions were devoted to sea salinity, sea wind, and ice. The following two sessions dealt with missions and experimental campaigns. At the end of the first day, delegates of ESA, AIPAS, and Alenia Spazio gave a presentation on their activities. The second day began with a session that was devoted to soil and vegetation, which was followed by two sessions on clear-air and clouds applications. The second day was concluded by a session on snow cover. A session on electromagnetic models and a session on retrieval methodologies opened the third day. Two sessions were dedicated to clouds and precipitation remote sensing. The last day of the meeting was devoted to both sensor calibration and instrument and advanced techniques. The meeting ended with brief concluding remarks given by Dr. A. Gasiewski, current President of the GRSS, and by Prof. M. T. Hallikainen, President of URSI Commission F.

The week of the meeting was affected by frigid weather with temperatures well below the seasonal average in Rome, northern winds and some showers. Nonetheless, the participants enjoyed both the meeting and the city. Last, but not least, the number of participants who attended the social dinner were 88, more than 55% of the meeting attendees. The social dinner was held in a typical Roman restaurant, called "Orazio," close to the Terme di Caracalla and Fori Romani. The meal was highlighted by good local food and wine. At the end of the dinner, a bus was offered for a memorable night sightseeing of Rome (in spite of the drizzle). The meeting was concluded by a MicroRad04 cake party and by the announcement of the next MicroRad Specialist Meeting that will be chaired by Dr. S. Reising and planned for February 2006.

All the abstracts have been collected in a single booklet distributed during the meeting. They have been also published in the *Atti della Fondazione Giorgio Ronchi* (year LX, n. 1-2, January-April 2005) and are available through the editor (<http://ronchi.iei.pi.cnr.it>). The workshop proceedings (ISSN 1824-2383, edited by N. Pierdicca and F.S. Marzano) containing 67 short papers, classified by sessions and authors, have been published on a CD-ROM which has been distributed to all participants and can be requested by those who are interested by e-mail (microrad04@die.uniroma1.it).

From these conference presentations, 22 papers have been accepted for inclusion into this TGRS Special Issue. In the organization of this special issue, we have placed the 26 accepted papers into five main categories: Remote Sensing of the

Surface (6); Remote Sensing of the Atmosphere (7); Retrieval Methods (4); Electromagnetic Modeling (4); and Advanced Instruments and Calibration (5). As it emerges from this list and from the table of contents, the published papers, selected through a rigorous review process, span a wide range of microwave radiometry applications to remote sensing and deeply reflect the variety of topics and discussions had during the meeting itself.

Many people and institutions contributed to the success of the MicroRad04 conference. The meeting co-chairs, Dr. N. Pierdicca and Dr. F. S. Marzano, acknowledge the outstanding work of the local organizing team, led by the Scientific Secretariat Dr. G. Calabresi and Dr. L. Pulvirenti, with the help of Mrs. S. Pongracz, Mr. M. Mazzetta, and M. Fascetti. A thankful acknowledgement goes to the session chairpersons and to the Scientific and Steering Committee, composed by Dr. G. d'Auria, Dr. A. Gasiewski, Dr. B. Greco, Dr. R. Guzzi, Dr. M. T. Hallikainen, Dr. M. Martin-Neira, Dr. A. Mugnai, Dr. S. Paloscia, Dr. P. Pampaloni, Dr. D. Solimini, Dr. C. T. Swift, Dr. J. Vivekanandan, and Dr. E. R. Westwater. In addition, numerous anonymous reviewers were exceedingly helpful in reviewing the papers, several of which required two reviews, and in adhering to the strict deadlines associated with this special issue. A final acknowledgment is addressed to the MicroRad04 sponsorship from Alenia Spazio, AIPAS, AMS-Gematronik, ASI, ASITA-AIT, CeTeM, CETEMPS - University of L'Aquila, ESA, IEEE-GRS Central-South Italy Section, IEEE-GRS-S, University "La Sapienza" of Rome, and URSI.

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Nazzareno Pierdicca (M'04) was born in Rome, Italy, on June 11, 1954. He received the laurea (Doctor) degree (cum laude) in electronic engineering from the University of Rome "La Sapienza," Rome, Italy, in 1981.

He is currently an Associate Professor in the Faculty of Engineering, University "La Sapienza" and teaches remote sensing and antennas. From 1978 to 1982, he was with the Italian Agency for Alternative Energy (ENEA), performing research and development activities in the field of thermal and mechanical behavior of the nuclear fuel rod. From 1982 to 1990, he worked with Telespazio, Rome, in the Remote Sensing Division. He was involved in and responsible for various projects concerning remote sensing applications, data interpretation, and ground segment design. He was Principal Investigator of the ESA/JRC Agrisar'86 airborne campaign and Co-Investigator of the X-SAR/SIR-C experiment. In November 1990, he joined the Department of Electronic Engineering, University "La Sapienza." His research interests mainly concern electromagnetic scattering models, microwave radiometry of the atmosphere, and SAR land applica-

tions. He has been Investigator of the MAC Europe'91 and X-SAR/SIR-C experiments. He is responsible for projects on the above topics funded by the Italian and the European Space Agency.

Dr. Pierdicca is a member of the IEEE Geoscience and Remote Sensing Society (GRSS), of the "Associazione Italiana di Telerilevamento" (AIT), and of "Centro di Telerilevamento a Microonde" (CeTeM).



Frank Silvio Marzano (S'89–M'99–SM'03) received the laurea degree (cum laude) in electrical engineering and the Ph.D. degree in applied electromagnetics, in 1988 and 1993, respectively, both from the University of Rome "La Sapienza," Rome, Italy.

He currently teaches a course on antennas and propagation and coordinates the satellite and radar remote sensing group within the Center of Excellence CETEMPS in the Department of Electrical Engineering, University of L'Aquila, L'Aquila, Italy. In 1993, he collaborated with the Institute of Atmospheric Physics (CNR), Rome. From 1994 until 1996, he was with the Italian Space Agency, Rome, as a Post-Doctorate Researcher. After being a Lecturer at the University of Perugia, Perugia, Italy, in 1997, he joined the Department of Electrical Engineering, University of L'Aquila. His current research interests are passive and active remote sensing of the atmosphere from ground-based, airborne, and spaceborne platforms, with a particular focus on precipitation using microwave and infrared data, development of inversion methods, radiative-transfer modeling of scattering media, and scintillation and rain-fading analysis along satellite microwave links.

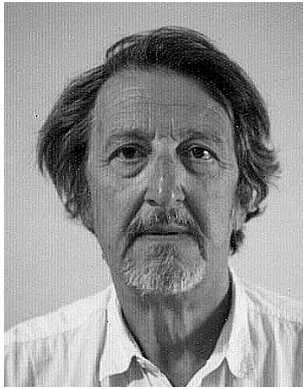
Dr. Marzano received the Young Scientist Award of the XXIV General Assembly of the International Union of Radio Science in 1993. In 1998, he was the recipient of the Alan Berman Publication Award from the Naval Research Laboratory, Washington, DC. Since 2001, he is the Italian National Delegate for the European COST actions number 720 on meteorological remote sensing and number 280 on satellite communications. He is an Associate Editor for IEEE GEOSCIENCE AND REMOTE SENSING LETTERS.



Martti T. Hallikainen (M'83–SM'85–F'93) received the M.S. degree in engineering and the Dir. Tech. degree from the Faculty of Electrical Engineering, Helsinki University of Technology (HUT), Espoo, Finland, in 1971 and 1980, respectively.

Since 1987, he has been a Professor of Space Technology at HUT, where his research interests include remote sensing and satellite technology. In 1988, he established the HUT Laboratory of Space Technology and serves as its Director. He was a Visiting Scientist from 1993 to 1994 at the European Union's Joint Research Centre, Institute for Remote Sensing Applications, Ispra, Italy. He was a Postdoctoral Fellow at the Remote Sensing Laboratory, University of Kansas, Lawrence, from 1981 to 1983, and was awarded an ASLA Fulbright Scholarship for graduate studies at the University of Texas, Austin, in 1974–1975. He is an author/coauthor of over 500 scientific publications.

Dr. Hallikainen served as President of IEEE Geoscience and Remote Sensing Society (IEEE GRSS) in 1996 and 1997, and as Vice President in 1994 and 1995. Since 1988, he has been a member of the IEEE GRSS Administrative Committee, and from 1999 to 2001, he served as the IEEE GRSS Nominations Committee Chair and since 2002, as the Fellow Search Committee Chair. He was the General Chairman of the IGARSS'91 Symposium and Guest Editor of the Special IGARSS'91 Issue of the IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING (TGARS). Since 1992, he has been an Associate Editor of TGARS. He was a member of the IEEE Periodicals Committee in 1997 and Corresponding member of the IEEE New Technology Directions Committee from 1992 to 1995. He was Secretary General of the European Association of Remote Sensing Laboratories (EARSeL) from 1989 to 1993 and Chairman of the Organizing Committee for the EARSeL 1989 General Assembly and Symposium. He has been a member of the EARSeL Council since 1985, and he was a member of the Editorial Board of the EARSeL Advances in Remote Sensing from 1992 to 1993. He has been a member of the European Space Agency's (ESA) Earth Science Advisory Committee since 1998 and a member of the ESA SMOS Scientific Advisory Group since 2000. He was a national delegate to the ESA Earth Observation Scientific and Technical Advisory Group (EOSTAG) from 1988 to 1994, and he has served in the same capacity on the ESA Earth Observation Data Operations Scientific and Technical Advisory Group (DOSTAG) since 1995. He was Thematic Coordinator of the ESA EMAC-95 airborne campaign for Snow and Ice activities. He was a member of the ESA Multi-frequency Imaging Microwave Radiometer (MIMR) Expert Group from 1988 to 1994 and was a member of the ESA MIMR Scientific Advisory Group from 1994 to 1996. Since 1992, he has been a member of both the Advisory Committee for the European Microwave Signature Laboratory of the European Union's Joint Research Centre and the National Liaison of the International Space University. He is currently serving as Chair of Commission F International Union of Radio Science (URSI) from 2002 to 2005 and has served as its Vice Chair from 1999 to 2002. He was a member of the URSI Long Range Planning Committee from 1996 to 1999, a member of the URSI Committee on Geosphere and Biosphere Program from 1989 to 1999, and a URSI representative to SCOR from 1999 to 2002. He has been a national official member of URSI Commission F (Wave Propagation and Remote Sensing) since 1988. He was Secretary of the Organizing Committee for the URSI Nordic Antenna Symposium in 1976, and he served as Secretary of the Finnish National Committee of URSI from 1975 to 1989. He was Vice Chair of the URSI Finnish National Committee from 1990 to 1996, and he has served as its Chair since 1997. He is Vice Chair of the Finnish National Committee of COSPAR since 2000. He is the recipient of three IEEE GRSS Awards: 1999 Distinguished Achievement Award, IGARSS'96 Interactive Paper Award, and 1994 Outstanding Service Award. He is the winner of the Microwave Prize for the best paper in the 1992 European Microwave Conference, and he received the HUT Foundation Award for excellence in research in 1990. He and his research team received the 1989 National Research Project of the Year Award from *Tekniikka & Talous* (*Technology & Management Magazine*). He received the 1984 Editorial Board Prize of Sähkö—Electricity in Finland.



Paolo Pampaloni (M'86–SM'95–F'99) received the degree in electronic engineering from the University of Bologna, Bologna, Italy, in 1964.

From 1964 to 1979, he has been involved in radioastronomy, solar physics, and telemetry of scientific satellites with the Arcetri Astrophysical Observatory, Florence, Italy. Since 1980, he has been with the Italian National Research Council (CNR), Florence, working on microwave remote sensing. From 1980 to 1983, he was Director of the Institute of Remote Sensing and Environmental Analysis, CNR, Florence. From 1983 to 1996, he was a Consultant for the European Space Agency (ESA) for microwave radiometry first as a member of the Land Application Working Group and then as member of the Microwave Imaging Multichannel Radiometer (MIMR) Scientific Advisory Group. In 1994, he was invited to join the ESA Earth Observation Advisory Group (EOAC). Since 1997, he has been a member of the ESA category 1 proposal evaluation team. He has served as Principal Investigator and Coinvestigator of several international projects and experiments in Europe and as Coordinator of numerous national and International

(INTAS) research programs. He has also served as X-SAR/SIR-C Project Scientist and Deputy Team Leader. He has presented several invited papers at the URSI GA, PIERS, and other international symposia. He has also served in various academic and professional establishments in roles such as a Tutor, External Referee, and/or External Examiner. He has been a Consultant for several companies in Italy and has served as reviewer for many international journals (*International Journal of Remote Sensing*, *Remote Sensing of Environment*, *Radio Science*, *Waves in Random Media*). His current research deals with active and passive microwave remote sensing of the environment and in particular with the study of microwave emission and scattering from natural media. He has published over 140 papers on international journal and conference proceedings and has edited three books with VSP Press.

Dr. Pampaloni received the IEEE GRSS Distinguished Achievements Award in 2004. He has served as General Chairman of the 2nd and 6th Specialist Meetings on Microwave Radiometry and Remote Sensing (Florence 1988 and 1999). He was the General Chairman of the 15th International Geoscience and Remote Sensing Symposium (IGARSS'95) and was Guest Editor of the Special IGARSS'95 Issue of the IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING. Since 1994 he has been frequently involved in the TPC of IGARSS. In addition, he has been Session Chairman and Organizer, as well as member of the technical program committees for numerous international conferences. He is an Associate Editor of the IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING. He is a National Official Member of URSI Commission F (Wave Propagation and Remote Sensing). He is member of Electromagnetic Academy (USA), President of the Microwave Remote Sensing Center, and Chairman of the IEEE Central and South Italy Section.



Ed R. Westwater (SM'91–F'01) was born in Denver, CO, in 1937. He received the B.A. degree in physics and mathematics from Western State College of Colorado, Gunnison, in 1959, and the M.S. and Ph.D. degrees from the University of Colorado, Boulder, in 1962 and 1970, respectively, both in physics

He is currently a Research Associate with the Cooperative Institute for Research in the Environmental Sciences (CIRES), University of Colorado/National Oceanic and Atmospheric Administration (NOAA), Boulder, CO, and is associated with the Microwave System Development Division of the Environmental Technology Laboratory (ETL), NOAA, Boulder, CO. He was employed by the U.S. Department of Commerce, Washington, DC, from 1960 to 1995, and joined CIRES in 1995. His research has been concerned with microwave absorption in the atmosphere, remote sensing of the ocean surface, microwave and infrared radiative transfer, ground- and satellite-based remote sensing by passive radiometry, and in the application of mathematical inversion techniques to problems in remote sensing. He has authored or coauthored 257 publications. He

was an Associate Editor of *Radio Science* (1998–2002).

Dr. Westwater received the 15th V. Vaisala Award from the World Meteorological Society in 2001, and in 2003, he received the Distinguished Achievement Award from the IEEE Geoscience and Remote Sensing Society. He was Chairman of URSI Commission F (2000 to 2002). He was the Chairman and Organizer of 1992 International Specialists Meeting on Microwave Radiometry and Remote Sensing Applications and was a coorganizer of the Specialist Conference on Microwave Remote Sensing'01. He also served as a Guest Editor of the IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING Special Issue devoted to Microrad 04. In 1997, he presented the American Meteorological Society Remote Sensing Lecture. He is a member of the American Meteorology Society, the American Geophysical Union, and the Mathematical Association of America.