



Matera's Sassi of World Heritage.

## Attendance at 14th Ka and Broadband Communications Conference, IAC2008 and SPSC2008

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This is a report on attendance at the 14th Ka & Broadband Com. Conf., held in Matera, Italy, IAC2008, Glasgow, U.K. and ESA SPSC2008, Rhodes Is., Greece for almost three weeks from the end of September to the beginning of October 2008.

### Ka & Broadband Com. Conf.

The 14th Ka and Broadband Communications Conference was held in Matera, Italy, on September 24–26, 2008. The author did not know until his travel started where Matera is, but Matera locates at around center of a heel of Italian boots-like landform, and it is a place at around 1 hour drive by car from Bari airport. Matera is famous as one of the World Heritage where remains such as an upper photograph of Sassi. The meeting place of the conference was taken at a new hotel, Hilton Garden Inn Matera, in a Matera suburb (see photograph). There were a little over 160 participants from U.S.A., Canada, Japan and so on as well as Europe. From Japan, Dr. Fukuchi, Professor of Tokyo Metropolitan University, Mr. Yamakawa, JAXA, Mr. Iida, ARIB, Mr. Kadowaki, Mr. Takahashi, Ms. Yoshimura, and Dr. Takayama, all NICT, and the author attended.

At the opening ceremony on September 24, 2008, opening addresses were presented by Mr. Frank Gargione (Satellite Systems Consultant, USA) of General Chair and Chair of Steering & Organizing Committee, Dr. Franco Marconicchio (Space Consultant, Italy) and Mr. Enrico Saggese (ASI-Agenzia Spaziale Italiana, Italy) of Co-Chair of Steering & Organizing Committee. After an opening ceremony, the 6th BroadSky Workshop sponsored by NICT was held with chairperson of Prof. Fukuchi and coordinator of Mr. Kadowaki and presentations related to WINDS satellite were performed. A program of this conference is shown below, although it was changed



Conference site: Hilton Garden Inn Matera.



Opening Addresses by Mr. Garigione, Dr. Marconicchio, and Mr. Saggese from left (Photo taken by Ms. Yoshimura and Dr. Takayama).

slightly in actual. As one of features of this conference, a session of optical communication was held for the first time, and its related eight papers were presented.

This conference has been held every year since No. 1 was held in 1995 and the author would like to express respect for the effort driving by Mr. Gargione, Mr. Kadowaki as a committee member from Japan and other members of the organization committee.



Snapshots at the 6th BroadSky Workshop, (upper) Mr. Kadowaki, presenter and Prof. Fukuchi, Chair, (lower) Listeners and Dr. Gedney, questioner (Both photos taken by Ms. Yoshimura and Dr. Takayama).

#### Program of 14th Ka and Broadband Com. Conf.

Wednesday, September 24, 2008

|               |  |   |
|---------------|--|---|
| 08:30 – 09:00 | Registration   |   |
| 09:00 – 09:30 | Opening  |   |
| 09:30 – 10:30 | SESSION 1:<br>Military and Dual Use Systems and Applications I (Room A)            | SESSION 2:<br>Distribution of Digital and High Definition Television Programming (Room B) |
| 10:30 – 11:00 | Coffee Break   |   |
| 11:00 – 12:30 | 6 <sup>th</sup> BROADSKY WORKSHOP (Room A)   |   |
| 12:30 – 13:30 | Lunch Break  |   |
| 13:30 – 14:45 | 6 <sup>th</sup> BROADSKY WORKSHOP (Room A)   | SESSION 3A:<br>Propagation and Fade Mitigation I (Room B)                                 |
| 14:45 – 15:00 | Coffee Break   |   |
| 15:00 – 16:00 | 6 <sup>th</sup> BROADSKY WORKSHOP (Room A)   | SESSION 3B:<br>Propagation and Fade Mitigation II (Room B)                                |
| 16:15         | Visit at ASI and Telespazio Earth Observation Data Processing Facilities in Matera |   |
| 18:00         | Tour of the "Sassi" and Cocktail   |   |

Thursday, September 25, 2008

|               |  |  |  |
|---------------|--|--|--|
| 08:30 – 09:00 | Registration   |  |  |
| 09:00 – 10:30 | SESSION 4:<br>Military and Dual Use Systems and Applications II (Room A) | SESSION 5:<br>Small Missions (Room B)    | SESSION 6:<br>Earth Observation Applications (Room C)                                    |
| 10:30 – 11:00 | Coffee Break   |  |  |
| 11:00 – 12:30 | SESSION 7:<br>Broadband Network Systems I (Room A)                       | SESSION 8:<br>Galileo (Room B)           | SESSION 9:<br>Broadband applications and Medicine: new insights into the future (Room C) |
| 12:30 – 14:30 | Lunch Break  |  |  |
| 14:30 – 16:00 | SESSION 10A:<br>Advances in Components I (Room A)                        | SESSION 11A:<br>COSMO SkyMed I (Room B)  | SESSION 12: New and Updated Broadband Flight Systems (Room C)                            |
| 16:00 – 16:30 | Coffee Break   |  |  |
| 16:30 – 17:45 | SESSION 10B: Advances in Components II (Room A)                          | SESSION 11B:<br>COSMO SkyMed II (Room B) |  |
| 20:30         | Conference Dinner  |  |  |

Friday, September 26, 2008

|               |  |   |
|---------------|--|---|
| 08:30 – 09:00 | Registration   |   |
| 09:00 – 10:15 | SESSION 13:<br>Satellite-aided Navigation (Room A)                             | SESSION 14:<br>Mobile Broadband Services (Room B) |
| 10:15 – 10:45 | Coffee Break   |   |
| 10:45 – 11:45 | SESSION 15A:<br>Broadband Network Systems II (Room A)                          | SESSION 16A:<br>Laser Communications I (Room B)   |
| 11:45 – 12:45 | SESSION 15B:<br>Broadband Network Systems III (Room A)                         | SESSION 16B:<br>Laser Communications II (Room B)  |
| 12:45 – 13:00 | CLOSING SESSION  |   |
| 13:00 – 14:00 | Lunch Break  |   |
| 14:00         | Visit at Alenia Aeronautica Plant in Grottaglie and guided tour of Alberobello |   |
| 20:00         | Dinner in Alberobello  |   |

#### IAC2008

The IAC2008 (59th International Astronautical Congress) was held in Glasgow, U.K. during a period of six days from September 29 to October 3, 2008. Although IAC has been held four times in



Site of IAC2008, Scottish Exhibition & Conference Centre along River Clyde, (left) Front entrance, (center) Side view called as Armadillo, (right) Playing bagpipes for the opening ceremony.





Video message from Prime Minister Brown and played Scottish dance at the Opening Ceremony.



Heads of space agencies at the Plenary Session 1.

the U.K., IAC2008 is held in Glasgow for the first time. So it appeared for the host to put a great deal of effort to hold it. IAC is the united international organizations body relating to space including IAF (International Astronautical Federation), IAA (International Academy of Astronautics), IISAL (International Institute of Space Law), international academic organizations and companies. It is held in many places of the world in autumn every year, and there is participation with more than 2000. There were many participants this time including JAXA with our country. It is expected that it will be held in Daejeon, Republic of Korea, in the next year 2009.

A program of Space Communication and Navigation Symposium is shown in a list below. The author presented a paper on communication requirement and communication system when we have a Mars human community. Prof. Kondo, NIME, Mr. Taira, Mr. Hashimoto and Dr. Toyoshima, all NICT, presented papers on the satellite communication related topics.

The SCAN (Space Communication and Navigation Committee) was held on October 1, with chairperson of Mr. J.M.Straus, Executive Vice President, Aerospace Corporation. In the SCAN, performing plenary in the next IAC2009, approval of adding Mr. Nagai of

Program of Space Communication and Navigation Symposium.

| Date      | Session | Title of Session                                     |
|-----------|---------|--|
| 29.Sep.08 | B2.1    | Advanced Systems                                     |
| 30.Sep.08 | B2.2    | Mobile Communications and Satellite Navigation       |
| 1.Oct.08  | B2.3    | Near-Earth and Interplanetary Communications Systems |
| 1.Oct.08  | B2.4    | Advanced Technologies                                |
| 2.Oct.08  | B2.5    | Fixed and Broadcast Services                         |
| 2.Oct.08  | B2.6    | Communication Satellite Infrastructure and Economics |

SCC to a committee as a new member, co-chairs and rapporteurs of symposium in IAC2009 were discussed. In addition, that there were many people who did not appear to present their paper in spite of appearing in program was taken up as a problem. In fact, the real presentations were a little over 60% for a prior announcement number of 70 this time.

#### SPSC2008

The 10th International Workshop on Signal Processing for Space Communications (SPSC2008) was held from October 6 to 8, 2008 in Rhodes Island, Greece. Dr. Nader Alagha of ESA/ESTEC served as General Chair of SPSC2008 and number of participants was a little under



Snapshot of SPSC2008 session.

## Program of SPSC2008.

| Monday<br>06-Oct |                  |  | Tuesday<br>07-Oct                                       |                                 |  |               | Wednesday<br>08-Oct  |  |               |     |  |
|------------------|------------------|--|---|---------------------------------|--|---------------|--|--|---------------|-----|--|
| 08:00 - 08:30    | Registration     |  | 08:00 - 08:30   | Registration                    |  |               | 08:00 - 08:30  | Registration   |               |     |  |
| 08:30 - 10:00    |                  | Opening Session & Introduction<br><i>she</i><br>(Imperial Ballroom A)          | 08:30 - 10:00   | S3                              | MIMO and diversity techniques for satellite communications<br>(Imperial Ballroom A)      | 08:30 - 10:00 | S4   | Signal processing for secure communications<br>(Ariadne Room)          | 08:30 - 10:00 | S9  | OBP and Advanced payload techniques (I)<br><i>Imperial Ballroom A</i><br><del>(Ariadne Room)</del> |
| 10:00            | Coffee Break     |  | 10:00   | Coffee Break                    |  |               | 10:00  | Coffee Break   |               |     |  |
| 10:30 - 12:00    |                  | Opening Session (con't)<br>(Imperial Ballroom A)                               | 10:30 - 12:00   | S5                              | Coding, Modulation & Synchronization Techniques<br>(Imperial Ballroom A)                 | 10:30 - 12:00 | S6   | Satellite Communications Simulation/Emulation Tools<br>(Ariadne Room)  | 10:30 - 12:00 | S10 | Advanced Digital Receiver Techniques<br>(Ariadne Room)   |
| 12:00            | Lunch            |  | 12:30   | Lunch                           |  |               | 12:30  | Lunch  |               |     |  |
| 14:00 - 15:30    | S1               | Mobile satellite multimedia broadcasting systems (I)<br>(Imperial Ballroom A)  | 14:00 - 16:00   | S7                              | On Board signal processing techniques and Emerging Applications<br>(Imperial Ballroom A) | 14:00 - 16:30 | S8   | Modulation, Synchronization and Detection Techniques<br>(Ariadne Room) | 14:30 - 16:00 | S11 | OBP and Advanced payload techniques (II)<br>(Ariadne Room)   |
| 15:30            | Coffee Break     |  | 16:00   | Coffee Break                    |  |               | 16:00  | end of day   |               |     |  |
| 16:00 - 18:00    | S2               | Mobile satellite multimedia broadcasting systems (II)<br>(Imperial Ballroom A) | 16:30 - 17:30   | Poster Session (Imperial Foyer) |  |               | Please see venue floorplan on page 15 of this booklet in order to locate the room of each session. |  |               |     |  |
| 18:00            | end of day       |  | 17:30   | end of day                      |  |               |  |  |               |     |  |
| 18:30            | Welcome Cocktail |  | Conference Dinner / Rooftop Garden & Pool, Hilton Hotel |                                 |  |               |  |  |               |     |  |

70. The author was alone participant from Japan. A program is shown in a figure above.

The author was asked to be a member of Technical Programme Committee. It was an honor to be assigned as an invited speaker in Opening Session when the author proposed a paper accepting Dr. Alagha's request. In the author's talk, the requirement and technology of satellite broadband during a period from 1990 to 2050 was presented.

### Impression

Because of a reason that many retired people might attended in the Ka and Broadband Com. Conf., this conference has a feature that there are many overlooking presentations such like the commercial satellite communication in the U.S. and Europe and its application to military commu-



Scenery from SPSC2008 site: Hilton Rhodes Resort (fluttering a flag of ESA and seeing Turkey in the opposite shore).



Entrance of the citadel of the Order of St. John of Jerusalem (World Heritage).



nications.

Since IAC2008 was held just after Chinese manned launching successes, it attracted participants' attention, but it was a problem that there were many cancellation or no-show of papers. Especially, in spite of that the final program includes many papers from China and India, almost all were cancelled in the field of satellite communications as a concrete example, although there might be a problem of obtaining Visa.

Finally, an impression for SPSC2008 is indicated below.

- (1) In spite of that the individual paper includes professional contents, there were many questions and answers. Since questions might be not possible unless it is followed well usually, discussion among each other seems to be conducted well usually.
- (2) ESA seems to support various countries, organizations, universities and companies to conduct various researches and many presentations seems to be based on it. It is heard that ESTEC encourages its officers to have a connection with a satellite associated company as well as EUTELSAT and INMARSAT.
- (3) Mr. Jose M. Casas, Deputy Telecommunications Department Manager, presented about ESA's telecommunications long term plan just before my presentation. He encouraged ESA to develop technologies by pointing out that the ESA goes behind the U.S. for all of ten several technical items (unfortunately the name of Japan did not come out).
- (4) Even if the topics of WINDS were talked about, it seemed not to be interested in the WINDS, because Europe does not participate in WINDS at all. This trend was same even in the Ka & Broadband Com. Conf. It is necessary to build some relation in the future.

According to the above-mentioned impression, the following would have to be taken account to make our study of satellite communications field in Japan more active.

- (1) To make researchers' discussions of each other more active. And to increase the opportunity that researchers can discuss each other more frequently, and to make an atmosphere that even any idea can be discussed together.
- (2) To make collaborative R&D with universities, outside organizations and space related companies more active by supporting them with NICT's fund.
- (3) To strengthen the relation with satellite communications companies and related manufacturing companies.
- (4) To share participation information among researchers on domestic and foreign conferences as a part of catching activity of an outside trend.

## Epilogue

I was able to have a valuable opportunity to feel depth of the European history by attendance at the above mentioned conferences. At the first visit, the Sassi of Matera is the remains in the 10th-13th century. This area including Bari is located along the Appia highway (Via Appia) that starts from Rome and leads to Brindisi in southern Italy in the 2nd century B.C.

In the second visit, it is said that the sanctuary of Glasgow was built in the 4th century. In addition, I saw a bronze statue (cf. photograph below) of Lord Kelvin who acted as a professor in the mid-19th century at the University of Glasgow. I felt a sense of closeness when I heard that, in fact, it was the person who introduced the absolute temperature scale known well among us.

At the last visit, the old town of Rhodes is a citadel of the Order of St. John of Jerusalem in the 14th-16th century. A description of the battle with Turkey is given into detail by the book: Nanami Shiono, "The Siege of Rhodes". The history of Rhodes was deeply impressive, when I knew that the place was right the port of Rhodes where a Colossus of Rhodes was built before more 2000 years from the times of the Order of St. John of Jerusalem. It is a statue of Greek god Helios of full length 34 m and one of the Seven Wonders of the Ancient World that Kylon (or Philon) wrote in the 3rd century B.C. The beautiful Aphrodite statue (cf. photograph below) excavated from here was also very impressive.

Finally, I would like to add the following: I read a book beforehand of my trip, that is written by Haruki Murakami, "Distant Drum" (in Japanese). The book is a traveler's diary including trips around islands in the Aegean Sea. Although I got tired for this trip due to various worries, a sentence in the book gave me a great encouragement that most of trips make us tired, but there are knowledge and



A distant view of University of Glasgow.



Statue of Lord Kelvin.



Aphrodite statue of Rhodes.

joy given for the first time after being tired.

(Photos taken by the author without special description)