

# CCSDS LINK

VOLUME 4 ISSUE 1 — AUGUST 2009

## CCSDS Mentioned in Congressional Testimony

Read about how CCSDS recommendations can help in maintaining a safe orbital environment.

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## Working Group Updates



Three CCSDS working groups have provided updates on their work.

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## For Your Information

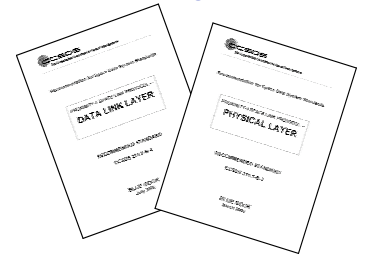
We've gathered information about upcoming meetings and other items that you may find of interest.

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## New and noteworthy

Take a look at the CCSDS documents that have recently been published or released for formal review.

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## Welcome to the CCSDS Link

The *Link* is intended to serve as a communication forum for the CCSDS community. Through content developed by CCSDS technical experts, members of the CMC and CESA, and by secretariat staff we hope to provide readers with a wealth of information about the organization and its work. Information in the *Link* is aimed at CCSDS participants as well as users of CCSDS specifications and technical information.

The CCSDS working groups and management bodies had the opportunity to meet at the Penrose House in Colorado Springs in April. While recent renovations required some creativity on the part of our NASA hosts, the meeting series was successful. We've included updates from some of the WGs and the CESA and CMC in this issue.

As always, we hope you find this issue of the *Link* informative and welcome any feedback you may have. Please do not hesitate to contact the [CCSDS Secretariat staff](#) with your comments or suggestions for content.



## Hello From Earth



People from around the world submitted short messages to an Australian website recently destined for transmission to Gliese 581d, an exoplanet approximately 20 light years from Earth. The messages were collected as part of Australia's National Science week and were sent on 28 August 2009 by the NASA/CSIRO Canberra Deep Space Communication Complex at Tidbinbilla, Australia, using the 70-meter main antenna known as DSS43.

More information can be found [here](#).

## U.S. Congressional Testimony Praises CCSDS Push for Greater Development of International Standards to Keep Space Environment Safe for All Users

Dr. Scott Pace, Director of the Space Policy Institute at the Elliot School of International Affairs at The George Washington University praised the Consultative Committee for Space Data Systems (CCSDS) for providing a venue for the world's space agencies to address important issues such as orbital debris mitigation by standardizing how data is collected, analyzed, and processed.

Testifying before the House Committee on Science and Technology's Subcommittee on Space and Aeronautics on the need to increase safe for civil and commercial users on April 28, Pace noted: "...there is a clear need for better space situational awareness for all space sectors – civil, commercial, and national security. While space traffic control may not be feasible, better space traffic monitoring is feasible. A first step in improved monitoring is to enable better, faster, standardized information exchanges among satellite owners and operators. Some good news here is that international, open standards are close to approval. The Consultative Committee for Space Data Standards (CCSDS) approved a Draft Recommended Standard for Orbit Data Messages in July of last year."

Praising the transparency of CCSDS standards, and the fact that the standards do not require the transfer of sensitive technologies between nations, Pace noted that they are valuable aids to international cooperation on the issue of ensuring a safer space environment.



Pace stated that while CCSDS standards allow a high degree of cooperation among space agencies, they are sometimes not fully supported by governing bodies. Pace urged supporting: "A more intentional U.S. strategy that resources and staffs international standards work" to "...improve the coordination of U.S. positions and the chances for greater international support of those positions."

Pace concluded his testimony by stating that by utilizing CCSDS standards and other governing documents, a space use regime, with input from governments, non-governmental organizations and private corporations working together to achieve a better space environment for all, is within reach, especially if such efforts were supported by all nations and users of space.

Pace's testimony coincided with CCSDS' annual spring meeting, at which attendees were drafting the very protocols that Pace called for, heralding the beginning of a long march toward a more orderly, safe space environment for all.

CCSDS salutes Dr. Pace's testimony and remains committed to working with all interested parties to ensure that the use of space is as safe and accessible to all users.

A complete transcript of Dr. Pace's testimony as well as that of the other panelists can be found [here](#).

## Technical Updates from the Spring 2009 CCSDS Working Group Meetings

The SOIS area had a successful series of meetings in Colorado Springs during the Spring 2009 Technical Meetings. The final draft of the SOIS Green Book Issue 2 was reviewed and will be published in the summer. Another green book, from the Wireless working group, is also under its final review. The Subnet working group's red books Issue 2 and the Application Support Services working group's Device Access, Device Data Pooling and Time Access Services red books issue 2 are out for a final agency review. It was decided that further working group reviews of the File and Packet Store and Message Transfer Services Red Books were needed before sending the documents out for agency review. Asset Management and Spacecraft Sensor Networks Red Books are also under development. Plug and Play sessions identified that their primary focus would be on defining Electronic Data Sheet for onboard devices. Finally, there were successful joint meetings SIS DTN and AMS working groups looking at how SIS and SOIS support each other.

The recent meetings of the CCSDS MOIMS area were successful and had several key highlights. The Data Archive Ingestion working group will be submitting the PAIS draft red book and the OAIS Reference Model 5 year review for agency review. The Navigation working group will be submitting the Navigation Data Message/XML document for agency review. Spacecraft Monitoring and Control Working Group will submit the GB and Missions Operations Reference Model for CESC/CMC review. The Digital Repository Audit and Certification Working Group will be submitting the Metrics for Digital Repository Audit and Certification and Requirements for Bodies Providing Audit and Certification of Digital Repositories red books for Agency Review.

The Service Management Working Group assessed the Red-3 version of the service management recommendation against the prototyping interoperation results, performed some very minor modifications in accordance with prototype findings, and concluded its development efforts for the recommendation. The final prototype interoperation test report is currently being assembled. The Cross Support Transfer Services Working Group made good progress on the CSTS Framework, Guidelines and

Concept Books and developed prototype interoperation plans for verification/validation efforts of the CSTS framework and monitoring service draft recommendations.

## First High Data Rate Modulation Transmission from Space Uses CCSDS Standard for Successful Transmission

On May 16 the European Space Agency's (ESA) Hershel Earth Observatory spacecraft made the first Gaussian Minimum Shift Keying (GMSK) high data rate modulation transmission from space, using CCSDS' recommended standard "Radio Frequency and Modulation Systems – Part 1: Earth Station and Spacecraft, 401, part 2.4.17A," as the transmission's template.

The success of the transmission, and the implementation of CCSDS' standard, means that researchers now have an advanced standard for communication, beyond the commonly used Offset Quadrature Phase-Shift Keying (OQPSK) transmission standard used to communicate with spacecraft now. While prior transmission of GMSK transmissions were made only on land systems the ability to make such transmissions from space guarantees that space to earth communication will not be impeded by a rapidly dwindling amount of band-width within the most commonly used communication frequency bands under the OQPSK transmission standard – as the GMSK format, most commonly used for cell phone transmission and broadband internet connections on earth, allows for faster transmission of larger amounts of data than the OQPSK standard.

Implementation of the CCSDS standard allows users to obtain support for both GMKS and OQPSK standards of transmission across the user spectrum, as the standard clarifies user standards, and provides for a standardized order of implementation and support of the system.

## For Your Information

### Save the Date for Future CCSDS Meetings

The Fall 2009 Technical and Management Meetings will be held from 26 October to 5 November 2009 at ESTEC Headquarters in the Netherlands. The ESA Conference Planning Bureau and the CCSDS Secretariat are hard at work making final arrangements for the meeting and hope to have a meeting website open in the near future.



If you require a Letter of Invitation for Visa or travel booking purposes, please contact Erin Kahn at [erink@aiaa.org](mailto:erink@aiaa.org) for assistance.

As we finalize our preparations for the Fall 2009 meeting at ESTEC, please keep the following dates and locations in mind for our upcoming meetings.

### Spring 2009 Technical and CESG Meetings

3 – 11 May 2009

Renaissance Portsmouth Hotel and Waterfront Conference Center, Portsmouth, Virginia, USA.



<http://www.marriott.com/hotels/travel/orfpt-renaissance-portsmouth-hotel-and-waterfront-conference-center/>

### Summer 2010 Management Meetings

Hosted by INPE in Brazil

### Fall 2010 Meetings

Hosted by BNSC in London, England

### Spring 2011 Meetings

Hosted by DLR at DIN in Berlin, Germany

We are hoping this will be a joint meeting with ISO TC20/SC14

### Fall 2011 Meetings

Hosted by NASA, likely in conjunction with the ITC meeting in Las Vegas, USA

### Spring 2012 Meetings

We are pursuing opportunities to meeting in Stockholm, in conjunction with SpaceOps 2012

### Help Spread the Word About CCSDS

In an effort to keep the widespread and continued use of CCSDS work in front of the greater space community, we have developed an organization communication plan. Part of this plan calls for issuing periodic press releases coinciding with significant missions, mission milestones, successes, demonstrations in which CCSDS specifications have played a role.

While we on the Secretariat staff can monitor the U.S.-based missions fairly well, we would very much appreciate your help in keeping us apprised of events worthy of further publicity occurring within your local space programs.

Of course an opportunity for publicity does not necessarily have to be directly mission-related. If you feel that ongoing standard development work may be of interest to a broader audience, let us know and we will help you to get the word out.

Please send any and all suggestions you may have at any time to [secretariat@mailman.ccsds.org](mailto:secretariat@mailman.ccsds.org).

# New and Noteworthy

*The following documents have recently been released for formal agency review or have been published.*

## Documents Under Review (beginning October 2008)

The following draft CCSDS documents are currently open for public review and comment. A "Red Book" denotes a new draft CCSDS document released for review while "Pink Sheets" are proposed change pages to be added to currently published documents.

### CCSDS 505.0-R-2 (Red Book): XML Specification for Navigation Data Messages

The XML Specification for Navigation Data Messages draft Recommended Standard describes an integrated XML schema set that is suited to interagency exchanges of navigation data messages. The current issue incorporates changes reflecting comments received from the initial review and subsequent working-group development activities.

### CCSDS 735.1-R-2 (Red Book): Asynchronous Message Service

The draft Recommended Standard defines a CCSDS Asynchronous Message Service (AMS) for mission data system communications. The service and its protocol implement an architectural concept under which the modules of mission systems may be designed as if they were to operate in isolation, each one producing and consuming mission information without explicit awareness of which other modules are currently operating. The current issue incorporates changes resulting from the initial review.

Review instructions and comment deadlines can be found on the [CCSDS document review website](#).

## Recently Published Documents

[CCSDS 414.1-B-1, Pseudo-Noise \(PN\) Ranging Systems \(Blue Book, Issue 1, March 2009\)](#)

This Recommended Standard defines both transparent and regenerative PN ranging systems. The specifications for PN code components and generation, on-board spacecraft regenerative/transparent processing, ground station processing, and uplink and downlink signal modulation are defined.

[CCSDS 401.0-B-20, Radio Frequency and Modulation Systems--Part 1: Earth Stations and Spacecraft \(Blue Book, Issue 20, April 2009\)](#)

Numerous concise recommendations appear in the notebook volume bearing the number 401.0-B. Each recommendation is dated, and the most recent revision is shown in the table of contents. These Recommendations are developed for conventional near-Earth and deep-space missions having moderate communications requirements. The current issue updates recommendations 2.4.18 and 3.



The current mission count stands at [419](#)! Please help us to stay on top of this important statistic by informing the Secretariat any time a new program, mission, or vehicle you are working on decides to implement one of our specifications.

## CCSDS Leadership

**Mike Kearney** — CMC Chair and General Secretary

**Adrian Hooke** — CESC Co-Chair

**Nestor Peccia** — CESC Co-Chair

**Eduardo Bergamini** — ISO TC20/SC13 Chair

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