



**Location**

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Webinar via Cisco Webex

**Fee**

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EUR 1.180,-

CCG is a non-profit organisation, exempt from value-added tax in Germany. For foreign seminar locations the local tax regulations are applicable.

Members of CCG receive a discount of 10 %. Where several employees from one company / office apply for the same course, each participant will receive a discount of 10 %. For students special rates are available on request. Discounts cannot be combined.

Please pay by non-cash means after receiving the invoice.

**Registration**

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Please write or call (up to 3 weeks before the seminar) to Carl-Cranz-Gesellschaft e.V.; Argelsrieder Feld 11, D-82234 Wessling Tel. +49 (0) 8153 / 88 11 98 -12, Fax -19, E-Mail: anmelden@ccg-ev.de

**Internet:** www.ccg-ev.de

After receipt of registration, a confirmation letter will be sent.

**Further Information**

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For more information about our organization please do not hesitate to contact the CCG at Oberpfaffenhofen at the phone number given above.

For more information on the content of the seminar please contact

Tomaso de Cola, DLR, German Aerospace Center  
Oberpfaffenhofen, D-82234 Wessling  
Phone: +49 (0) 8153 / 28-2156, E-Mail: tomaso.decola@dlr.de

**Substitutions and Cancellations**

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Substitutions may be made at any time. Cancellation of an accepted registration made up to 10 days prior to the start of the seminar is subject to a EUR 25,- administrative fee. Participants canceling after that date are responsible for the entire seminar fee.

CCG reserves the right to cancel a course up to 10 days before the course's beginning in case of low number of participants or for other significant reasons. Furthermore, CCG reserves the right, against the announcement in the programme, to possibly replace at short notice a lecturer and also the lecturer's topic. Any claims for damages shall be excluded.

**Focus**

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The upcoming data science and EO missions will be requiring unprecedented high data rates in order to provide customers with large volume of data on daily basis. As such, a proper ground segment infrastructure tailored to such needs as well as sophisticated space segments are envisioned to meet these performance targets. More importantly, the overall system design has to be supported by proper communications protocols, from the physical layer up to the application. In this respect, the Consultative Committee for Space Data Systems (CCSDS), serving as standardization body for space missions, has been developing a rich framework to support the different phases of a mission and more interestingly has been developing a large portfolio of communication protocols that applicable to high-data rate missions. Starting from this baseline, this seminar will discuss the main communication protocol supporting telecommand and telemetry at the lower layers of the protocol stack, as well as elaborating further on the communications means to support more complex missions, where multiple interconnected space assets are present. As such, the seminar will also provide details about the opportunities offered by the Delay Tolerant Network (DTN) architecture and its interface with the lower layers of the protocol stack as well as its interworking with the applications in use for support the future space missions (such as CFDP and PUS protocols, just to cite a few of them).

**Who Should Attend**

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Engineers, scientists, managers, and technicians interested in state of the art satellite data communication technology and related services

**Lecturer**

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Tomaso de Cola	DLR, German Aerospace Center, Oberpfaffenhofen Institute of Communications and Navigation
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**Webinar DK 1.25**

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**CCSDS Protocol Stack for  
Future High Data Rate  
Space Missions**

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June 15 – 16, 2021

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**Scientific Coordination**

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Tomaso de Cola  
DLR, German Aerospace Center  
Oberpfaffenhofen

## Seminar Outline

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**Tuesday, June 15, 2021**  
**10.15 – 16.30**

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- 10.15 – 10.30 Introduction
- 10.30 – 11.00 **High data rate space missions**
- 11.00 – 12.00 **CCSDS protocols**  
 General introduction to the CCSDS standardization framework: main technical areas, overall management, specific activities in the context of communications
- 13.00 – 14.00 **ECSS Protocols**  
 General introduction to the ECSS standardization framework: main technical areas, overall management, specific activities in the context of communications
- 14.30 – 15.30 **Generalities about space communication protocols**  
 Concepts about CCSDS data communications, EPP, SPP, and interface between higher and lower layer protocols
- 15.30 – 16.30 **Telecommand**  
 Characteristics of datalink, channel coding and synchronization of TC and USLP specifications

**Wednesday, June 16, 2021**  
**09.30 – 16.30**

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- 09.30 – 12.00 **Telemetry**  
 Characteristics of datalink, channel coding and synchronization of TM, AOS, and USLP specifications. Overview of Proximity-1
- 13.00 – 14.30 **DTN protocols**  
 Overview of DTN protocol architecture, with focus on BP and LTP specifications. Overview of DTPC and the new BP specifications as well the ongoing CCSDS activities
- 15.00 – 16.30 **CFDP protocol**  
 Overview of the CFDP protocol and related operation configuration for file transfer; details about data communications and overall filestore management

### Material

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Each attendant will be provided with detailed course material in English.

### Language

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English