IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Near-Earth and Interplanetary Communications (6)

Author: Mr. Chaitanya Gopal
International Space University (ISU), France, chaitanya.gopal@community.isunet.edu

Mr. James Bultitude
International Space University (ISU), United States, james.bultitude@gmail.com
Mr. Christos Ntinos
International Space University (ISU), France, christos.ntinos@community.isunet.edu
Mr. Samuel Naef
International Space University (ISU), France, samuel.naef@community.isunet.edu
Ms. Ana Cristina Baltazar Garduño
International Space University (ISU), France, ana-c.baltazar@community.isunet.edu
Mr. Kwasi Nkansah
International Space University (ISU), Canada, kwasi.nkansah@community.isunet.edu
Ms. Essna Ghose
International Space University (ISU), France, essna.ghose@community.isunet.edu
Mr. Kunal Naik
International Space University (ISU), France, kunal.naik@community.isunet.edu
Mr. Vittorio Rossello
International Space University (ISU), France, Vittorio.Rossello@gmail.com
Ms. Yuan Yuan
International Space University (ISU), France, yuan.yuan@community.isunet.edu

APPROACHES TO OPTIMIZE DEEP SPACE TELECOMMUNICATIONS NETWORKS TO SUPPORT A NEWSPACE PARADIGM

Abstract

Deep Space communication systems are integral to modern space weather prediction, science missions and exploration. Historically these undertakings have been in the milieu of governments and government-based agencies. However, the emergence of NewSpace presents a challenge to this paradigm. Current Deep Space communication systems in the United States and elsewhere are aging and in need of additional throughput capacity. The responsibility for these upgrades now lies with more players than just national space agencies, as more entrants emerge in deep space including private entities and universities. Not only are there numerous planned scientific exploration missions, there exist emerging concepts such as a permanent human presence in deep space, and commercially driven enterprises such as asteroid mining that will require the support of robust communications. The urgency of such an expansion and upgrade to the network is emphasized by analyzing the space telecommunications market and the supporting infrastructure, along with opinions from industry and professionals alike. This paper presents the argument for a commercial Deep Space Network to support future commercial and government missions. Options for the formulation, organization and profitability of such a system are discussed. Next, private company undertakings, public private partnerships and international cooperation methods are examined. Finally, recommendations for the next steps are outlined.