



GUJARAT TECHNOLOGICAL UNIVERSITY

Report on

Live Telecast of WEBINAR on

"Pico/Nano/Micro-Satellites "(PNMSats)

A New Paradigm for Aspiring Engineers

Friday, May 1, 2015

CiC3

Community Innovation & Co-Creation Centre

Room No: 128, Gujarat Technological University, ACPC Building,
L.D. Engineering College Campus,
Navrangpura, Ahmedabad

Report

CiC3 organized Live Telecast of Webinar Virtual Academy: Pico/Nano/Micro - Satellites (PNMSats) for Engineering Students and Faculty members on Friday, May 1, 2015 from 4:30 PM to 5:30 PM at CiC3, Room No: 128, Gujarat Technological University, ACPC Building, L.D. Engineering College Campus, Navrangpura, Ahmedabad.

Detail about Webinar:

Abstract:

PNMSats have transformed the way we perceive satellites and made space accessible to budding engineers, scientists and amazingly, even high school students. PNMSats are playing a pivotal role of complementing conventional satellites and in effect, contributing significantly to workforce development for the space industry. PNMSats' system design and development is truly multidisciplinary engineering involving Aerospace Engineering, Mechanical Engineering, Electrical, Electronics and Communication Engineering, Computer Science and Engineering, Structural and Thermal Engineering, Systems Engineering and more. Complete Abstract and Bio: <http://wp.me/a3jwxB-zl>

Presenter:

Dr. Sharan Asundi is an Assistant Professor in the Aerospace Science Engineering department at Tuskegee University, which is the first and only historically black institution of higher learning to offer an accredited BS degree program in this field. He has collaborated with NASA Goddard Space Flight Center to conduct research in the field of small satellites. He is actively pursuing support from NASA, AFRL, NSF and other organization supporting research in aerospace.

Research Fields:

- Small Satellites Design & Development
- Spacecraft Attitude Determination & Control
- Autonomous Systems Design & Development
- Systems Engineering for Small Satellites
- Vehicle Health Monitoring

More info about webinar at:

http://gtu.ac.in/circulars/15Apr/27042015_WEBINAR3.pdf

Webinar Session:

Dr. Sharan Asundi highlighted the relevance of engineering disciplines to PNMSat missions like about Mission definition, mission objective, mission requirements, building blocks, components, interfaces & tasks. He also described about Mission Mapping on the basis of PMO – Primary Mission Objective, AMR- Allocated Mission Requirement & DMR – Derived Mission Requirement. He discussed about Mission Mapping Process, system approach – flow down, mission profile.

He shared his involvement and contribution in a Pico satellite mission at University of Florida, which was launched out of National Aeronautics and Space Administration's (NASA's) Wallops Flight Facility, which has Altitude Control System (ACS), Altitude Determination System (ADS), Payload, Telemetry Tracking & Command (TT&C), Command and Data Handling (CDH), Electrical Power system (EPS), Structures & Thermal. The mission payload, a precision three axes attitude control system for PNMSats was briefly discussed. Its intent to demonstrate rapid retargeting and precision pointing, which could serve tasks such as space based disaster monitoring are briefly presented.

He explained Altitude Control System (ACS) consists of motor driver board (TI-DSP based) & magnetic coil (embedded in custom solar panels). He discussed about Altitude Determination System (ADS), role of attitude determination system, its design, development and characterization. The attitude stabilization system which has embedded magnetic coils in the solar panels was briefly described. The accommodation of commercial-off-the-shelf (COTS) in the system engineering approach was also presented through the electrical power system components. As part of the solution to address limitations imposed by the PNMSat form factor and mass specifications, the distributed computing architecture of the command and data handling system, its design and development were discussed. The design and development of the structural chassis to house the CubeSat is discussed. The two components of communication – ground and space were discussed.

The presentation identifies some of the utilities demonstrated by PNMSats in the past and some of the potential utilities under development. Last but not the least; the talk intends to motivate the engineering academia and industry to seek enterprising diverse careers by involving themselves in PNMSat missions.

At the end of the session, several questions were asked by the students of GTU. Dr. Sharan replied with technical examples and he also explained students about how ISRO and NASA can help them if they have real innovative ideas in space technologies.



[Students watching live telecast of Webinar]